

The Canadian Medical Association Journal



Contents

ORIGINAL ARTICLES	PAGE	PAGE	
A clinical study of four hundred patients with bronchial asthma. By I. Chandler Walker, M.D.	97	demic occurring in the Quebec garrison. By E. A. Robertson, M.D., Captain C.A.M.C.	155
Some aspects of military ophthalmology. By Colonel S. Hanford McKee, C.M.G.	108	Pleurisy: Experimental and Clinical. By Robert C. Paterson, M.D.	160
Administration of arsenic in syphilis. By Major W. T. Lockhart, C.A.M.C., and Captain J. R. Atkinson, C.A.M.C.	129	EDITORIAL	
Venereal Diseases; their treatment and cure. By Omar Wilson, M.D.	136	War-trained specialists for the Board of Pensions	175
Artificial pneumothorax in the treatment of pulmonary tuberculosis. By Eugène Grenier, M.D.	141	Editorial notes	176
The eyesight of the negroes of Africa. By J. N. Roy, M.D.	144	OBITUARY	
Clinical notes on the influenza epi-		Dr. Lionel Beech	179
		Dr. Philip Howard Spohn	179
		Dr. William Thomas Little	180
		Dr. J. W. Atkinson	180
		MISCELLANY	
		News, Provincial	182
		News, Army Medical	186
		Book Reviews	189

TORONTO: GEORGE N. MORANG, PUBLISHER

ETHER
— FOR —
ANAESTHESIA
M. C. W.

MALLINCKRODT CHEMICAL WORKS, of Canada, Limited
MONTREAL

Neodiarsenol

is a very convenient form of arsenic for the treatment of syphilis.

General practitioners will find it particularly useful when the facilities of their offices are not close at hand.

It takes only a few minutes to prepare and administer Neodiarsenol, and the expense is not great.

SYNTHETIC
TORONTO



DRUG CO.
LIMITED
CANADA



The Canadian Medical Association Journal

VOL. IX.

FEBRUARY, 1919

No. 2

A CLINICAL STUDY OF FOUR HUNDRED PATIENTS WITH BRONCHIAL ASTHMA

BY I. CHANDLER WALKER, M.D.

Boston, Mass.

MY aim in this paper is to present as many useful facts as possible in the determination of the cause and the treatment of bronchial asthma. These facts, which have been obtained from a study of four hundred patients with bronchial asthma, may all be used to advantage by you in general practice.

The cases were about equally divided between the two sexes; there were one hundred and ninety-eight males and two hundred and two females in the series. The nationality of the patient played no part in the cause or the frequency of the disease; so-called neurotic races, as for instance the Jewish race, were no more prone to asthma than other nationalities. Occupation, as a rule, played no part in the cause or frequency of asthma, however, occasionally occupation did have a bearing upon the cause of asthma. For instance bakers frequently have bronchial asthma from the inhalation of the flour with which they work. Two unusual instances where occupation bore a direct relationship to the cause of asthma are sufficiently interesting to mention. A man whose work consisted of sifting green coffee beans became sensitized to the protein in the green husks and had asthma from the protein. Another man whose work was that of a jewel polisher became sensitized to the protein in the dust from the boxwood with which he polished the jewels. An enquiry also should be made always in regard to the presence of pet and domestic animals at the patient's home, and where he works.

Read at the Hamilton Meeting, May 30th, 1918.

The mode of onset of asthma or the symptoms preceding asthma have little bearing upon the cause since, in the majority of cases, the onset is with what the patient calls a cold or bronchitis. Frequently these colds and attacks of bronchitis are not such in the sense of a disease or an infection but instead they are the first symptoms of sensitization to some protein, and months may elapse before the physician realizes that the patient has asthma, and the association of eczema with bronchitis and asthma is of considerable importance since such patients are frequently sensitive to some type of protein, the younger the patient is when these conditions manifest themselves the more probable it is that the patient is sensitive to some food protein. This is especially true in infancy.

The time of the year at which the patient began to have asthma and the season of the year, if it always limits the attack of asthma, is important. Attacks of asthma which occur only during the summer months are usually caused by the protein in the pollen of plants. In many instances this summer type of pollen asthma is prolonged throughout the year by bacteria which, because of the patient's lowered resistance, cause a bronchitis and this in turn causes asthma. In a few instances, the early type of summer asthma is due to bacteria rather than to pollens. A number of patients have asthma only in the early spring (March and April) and in the late fall (October and November) and these patients associate asthma with the changeable weather; in such cases bacteria are frequently the cause. Some patients have asthma only in the winter months when the air is clear and cold and bacteria are again the cause.

The length of time that a patient has had asthma is important since one must bear in mind that the longer one has asthma the more pronounced may be the resultant bronchitis and emphysema so that the asthma may not be relieved by removing the offending cause but the bronchitis must also be treated. The age of onset of asthma is most important, but before we go into this we must define sensitization and outline the methods of testing a patient to determine whether he is sensitive or not.

When a person is sensitive or anaphylactic to a particular substance, ill effects or certain symptoms are produced in that person by the entrance of that substance into his body. One type of ill effect or symptom is an attack of bronchial asthma. We also know that it is the protein element in that substance that causes asthma, and we must not lose sight of the fact that proteins are most widely distributed in nature. Therefore pa-

tients may be sensitive or anaphylactic to proteins and if so these proteins may be the cause of bronchial asthma. Proteins enter the body by inhalation, by ingestion, by absorption and by infection. Inhalation takes place through the respiratory tract and chiefly concerns the protein in the pollen of plants, in the emanations and hair of animals, in the flour of cereal grains and in some kinds of dust. Ingestion has to do with the protein in food and we know that foods after entrance into the gastro-intestinal tract do cause asthma. Absorption apart from inhalation and ingestion concerns the conjunctives and to a less extent the skin. By infection we mean the presence of pathogenic bacteria in any part of the body but more especially foci of infection located in the teeth, tonsils, nose, throat and lungs. In the case of bacteria we have to deal with the protein element as well as with the infectious element.

There are several ways of testing a patient in order to determine whether or not he may be sensitive to proteins. One commonly used method is known as the intradermal test which in our experience has proven to be too sensitive and too delicate if not erratic. The test which has proven to be safe and reliable as regards hay fever and asthma is the skin or cutaneous test which is performed as follows: A number of small cuts, each about one eighth of an inch long, are made on the flexor surfaces of the forearm. These cuts are made with a sharp scalpel, but are not deep enough to draw blood, although they do penetrate the skin. On each cut is placed a protein and to it is added a drop of tenth-normal sodium hydroxide solution to dissolve the protein and to permit of its rapid absorption. At the end of a half hour the proteins are washed off and the reactions are noted, always comparing the inoculated cuts with normal controls on which no protein was placed. A positive reaction consists of a raised white elevation or urticarial wheal surrounding the cut. The smallest reaction that we call positive must measure 0.5 cm. in diameter and any smaller reactions are called doubtful. Negative skin tests with proteins rule out those proteins as a cause of asthma and all proteins which give a positive skin test should be suspected as a cause of asthma. In the case of bacteria, however, the skin test has to do only with the protein element, so that even though bacteria give a negative test they may still be a cause of asthma through their infectious nature and the patient need not be sensitized to bacterial protein.

Of the four hundred cases studied, one hundred and ninety-one or 48 per cent. gave a positive skin test and were therefore

sensitive to some protein. According to sex, 53 per cent. of the sensitive cases were males and 47 per cent. were females, and of the total number of males studied, 51 per cent. were sensitive, and of the total number of females, 44 per cent. were sensitive. Therefore, although the prevalence of asthma between the two sexes was about equally divided, the percentage of sensitive cases was a little higher among the males than among the females. While considering the above percentages of sensitive cases it should be borne in mind that doubtful and slightly positive skin tests are not being counted; only those reactions which were a distinct urticarial wheal measuring 0.5 cm. or more in diameter are included, so that the number of sensitive cases is computed on a very conservative basis.

The following table is presented in order to show the importance of the age of onset of bronchial asthma. In the first column the age of the patient is divided into five year periods with the exception of the first five years of life, which is subdivided into two periods, namely under two years of age which corresponds to infancy, and between the ages of two and five. Other columns, by following across the page on a line with the age of onset, show respectively the number of cases, the percentage of cases, the number of sensitive cases, the percentage of sensitive cases, and the number of cases sensitive to the proteins which are found in the four principal sources, namely, animal hair, food, bacteria and pollens at that particular age of onset of asthma.

Age of onset of asthma	Num- ber of cases	Per- cent. of cases	Num- ber sensi- tive	Per- cent. sensi- tive	No. sensitive to protein in			
					Animal hair	Food	Bac- teria	Pollen
Under 2 years.....	34	9	28	83	19	23	5	15
Between 2 and 5.....	30	7.5	27	90	14	9	2	6
" 5 " 10.....	37	9	15	40	12	5	2	15
" 10 " 15.....	35	9	24	70	6	5	5	13
" 15 " 20.....	26	6.5	14	54	8	5	2	5
" 20 " 25.....	42	10	22	52	6	7	2	12
" 25 " 30.....	35	9	17	49	7	1	5	9
" 30 " 35.....	43	10	21	49	3	4	5	9
" 35 " 40.....	52	13	12	23	2	5	4	3
" 40 " 45.....	37	9	9	24	1	4	1	3
" 45 " 50.....	9	2.2	2	22	0	0	0	2
" 50 " 55.....	11	2.7	0	0	0	0	0	0
" 55 " 60.....	6	1.5	0	0	0	0	0	0
Over 60.....	3	0.7	0	0	0	0	0	0
Total.....	400	..	191	48	78	68	33	92

It is noted that about the same number of patients had their first attack of asthma at each period of years with the exception that after the age of forty-five there was a great decrease and after the age of sixty there were only three cases; it may be surprising to know that the number of cases who developed asthma under the age of two and between the ages of two and five was as great as at any other age. The relationship between the age of onset of asthma and the sensitization of the individual is important. Of the patients who began to have asthma under the age of two, 83 per cent. were sensitive to some protein; of those whose onset was between two and five, 90 per cent. were sensitive; of those beginning asthma between five and ten, 40 per cent. were sensitive; of those between ten and fifteen, 70 per cent. were sensitive; of those having onset of asthma during the succeeding five year periods between the ages of fifteen and thirty-five, 52 per cent. were sensitive for each period; between the ages of thirty-five and fifty only 23 per cent. were sensitive; and after the age of fifty no patients were sensitive. The above statements may be summarized as follows: 83 per cent. of the patients who began to have asthma during infancy (under the age of two) were sensitive, during childhood or between the ages of two and fifteen, 66 per cent. were sensitive; during young adult life or between the ages of fifteen and thirty-five, 52 per cent. were sensitive, during middle life or between the ages of thirty-five and fifty, 23 per cent. were sensitive and none were sensitive when the age of onset of asthma was after fifty. Stated briefly, four fifths of the patients who began asthma during infancy were sensitive, two-thirds who began during childhood were sensitive; one half of those beginning asthma during young adult life were sensitive, one fourth of those beginning asthma during adult life were sensitive and none were sensitive that began asthma after the age of fifty; as the age of onset of asthma increases, the frequency of sensitization decreases and the knowledge of this is a great help in practice.

The relationship between the age of onset of asthma and sensitization to different types of protein is also very important. In the table, it is noted that nineteen patients, who began to have asthma under the age of two, were sensitive to animal hair proteins; of this number, ten were sensitive to the proteins of horse hair alone, one to cat hair alone and the other eight patients were sensitive to the proteins of the hair of horse, cat and dog although they were more sensitive to the hair of horse than to the hair of the cat or dog. Of the patients whose onset of asthma was be-

tween the ages of two and five and between five and ten, fourteen and twelve patients respectively were sensitive to the proteins of animal hair and in each instance eight of these patients were sensitive to horse hair proteins. Succeeding ages of onset of asthma show a gradual decrease in the number who were sensitive to animal hair protein. Sensitization to food proteins was by far most frequent among those patients who began to have asthma during infancy. Of the twenty-three patients, nine were sensitive to egg protein, eight to the cereal grains, and three to milk. Of the nine patients who began asthma between the ages of two and five and who were sensitive to food proteins, two were sensitive to egg and five to cereal grain proteins. Succeeding ages of onset of asthma show about a constant average of frequency in the sensitization to foods, but the frequency of sensitization to egg, milk, and cereals is much less than for other food proteins such as fish, meat and potato.

The frequency of sensitization to the bacterial proteins was about the same for all ages up to forty years. More patients were sensitive to the protein of *staphylococcus pyogenes aureus* than to any other type of bacterial protein, however, sensitization to the protein of *staphylococcus pyogenes albus* and the various streptococci was sufficiently frequent to warrant routine tests with these. In the above table the number of positive reactions with bacterial proteins is too conservative since many definitely positive reactions which do not measure 0.5 cm. in diameter are obtained.

It is of interest to note the effect of occupation on sensitization after the age of forty. Of the eleven patients who became sensitive to proteins after the age of forty, four were bakers and were sensitive to wheat protein, one was a hostler and was sensitive to horse dandruff protein, and another who was a sifter of green coffee beans was sensitive to green coffee protein; therefore in over half of these cases occupation was responsible for the cause of asthma.

In the table it is noted that seventy-eight patients were sensitive to the protein derived from animal hair. Of this number, forty-three were sensitive to horse hair alone, five to cat hair alone, three to feathers alone, two to cattle hair alone, one to wool alone; the remaining twenty-four patients were all sensitive to horse hair in combination with either dog hair or some of the other types of hair. Therefore of animal emanations, the protein of horse hair is by far the most frequent cause of asthma, and the hair of the dog is the least frequent cause of asthma.

Of the sixty-eight patients who were sensitive to the food proteins, thirty-five were sensitive to the cereal grains and of these thirty-five, twenty-five were sensitive to wheat alone, three to corn alone, two to rice alone and the remaining five patients were sensitive to all of the cereal grains. Among the thirty-three remaining food cases, thirteen were sensitive to egg, five to casein, eight to fish, and seven to potato; an occasional patient who was sensitive to one of these types of proteins was also sensitive to some other food protein such as beef, chicken, or spinach, but sensitization to foods, other than those already mentioned, was unusual. Therefore one half of the food cases were sensitive to the proteins of the cereals and wheat was by far the most common food to cause asthma; next to wheat in frequency came egg, then fish, potato and casein were close thirds, and other foods were too infrequent to be enumerated.

Of the ninety-two patients who were sensitive to pollens, seventeen were sensitive to the early pollens and timothy was the chief one of these, forty-five were sensitive to the late pollen and ragweed was the chief one of these, and the remaining thirty patients were sensitive to both early and late pollens. Sensitization to rose, red top, daisy and golden rod was infrequent.

There is one more important point which the above table illustrates, namely, multiple sensitization or sensitization to more than one type of protein. For instance, if we add together the number of cases who were sensitive to horse hair, food, bacteria and pollens we have a total of two hundred and seventy-two sensitive patients, whereas, in reality, there were only one hundred and ninety-one sensitive patients in the series. In other words, some of the patients were sensitive to more than one type of protein. On consulting the table it is noted that multiple sensitization is by far most frequent among those patients who began to have asthma during infancy, that it is quite frequent among those beginning asthma between the ages of two and five, and five and ten, but after these ages multiple sensitization is not very usual. Since the majority of the patients in this series were young adults or older when tested, it is fair to assume that the longer a sensitive patient has asthma the more apt he is to be sensitive to more than one type of protein, and sensitization to one protein early in life is apt to be followed by sensitization to other proteins early in life; and vice versa non-sensitization early in life is not so apt to be followed by sensitization later on. Among the few infants which were tested in this series multiple sensitization was frequent.

A positive skin test with several different proteins may mean that all of them are causing asthma or that only some of them are causing asthma, at present and that the others have been or may be in the future the cause; or even it may mean that none of the proteins are at present the cause, but that they have been and now secondary infection is the chief cause of asthma. Treatment will naturally reveal the present cause. Suffice it to say that positive skin tests by proteins, which seem to have no bearing on the cause of asthma, should be considered as danger signals and not as false reactions; such positive tests should not be disregarded.

The treatment of sensitive cases is largely a matter of judgment in deciding which positive test should be first investigated. If the patient is sensitive to food proteins, such foods should be omitted from the patient's diet for at least a month in order to see what effect they have on the asthmatic condition. In this series of cases nearly all such patients have been relieved of asthma. In a few instances, however, because of the associated bronchitis, autogenous sputum vaccines have been required in conjunction with the restricted diet. Attempts to desensitize the patient against offending food protein by the subcutaneous injection of, or by feeding gradually increasing amounts of the protein, have failed. We have reasons, however, for believing that total abstinence from the offending protein for a long interval automatically desensitizes the patient for that protein.

Patients who are sensitive to bacterial proteins may be successfully desensitized against such by treatment with vaccines of those organisms, but great care must be exercised not to give too large and too rapid an increase in the amount of vaccine. The first dose of vaccine should not be larger than one hundred million bacteria and each succeeding dose should not be more than fifty million over the preceding dose.

Before treatment is undertaken for those patients who are sensitive to the protein of horse dandruff or hair and of pollens, skin tests must be done using various dilutions of these proteins. Treatment should be begun with the dilution next higher than that which gave a positive test; the first dose should be small, usually 0.1 c.c. and each succeeding dose should not be more than 0.1 c.c. over the preceding one. These treatments may be given at five day or seven day intervals. The treatment of patients who are sensitive to hair proteins with the serum of the animal is of no avail and is very dangerous. Patients who are sensitive

to pollen proteins should be treated in anticipation of the season. Occasionally it is necessary to use vaccines in conjunction with the animal hair proteins in order to benefit the associated bronchitis but usually this is not the case.

Those patients who show multiple sensitization, that is those who give positive skin tests with many different types of proteins, are the most troublesome to treat; in such cases treatment is a matter of judgement. Not an unusual case is one who gives positive skin tests with the proteins of wheat, horse hair, and pollens. Naturally wheat should be omitted from the diet any way and, if the patient is exposed to horses, treatment should be given with the horse hair proteins; in fact such treatment is advisable since the patient may be at any time so exposed, and in anticipation of the pollen season the patient should be desensitized against these. Thus all possible known causes will be eliminated. Even then autogenous sputum vaccines may be required.

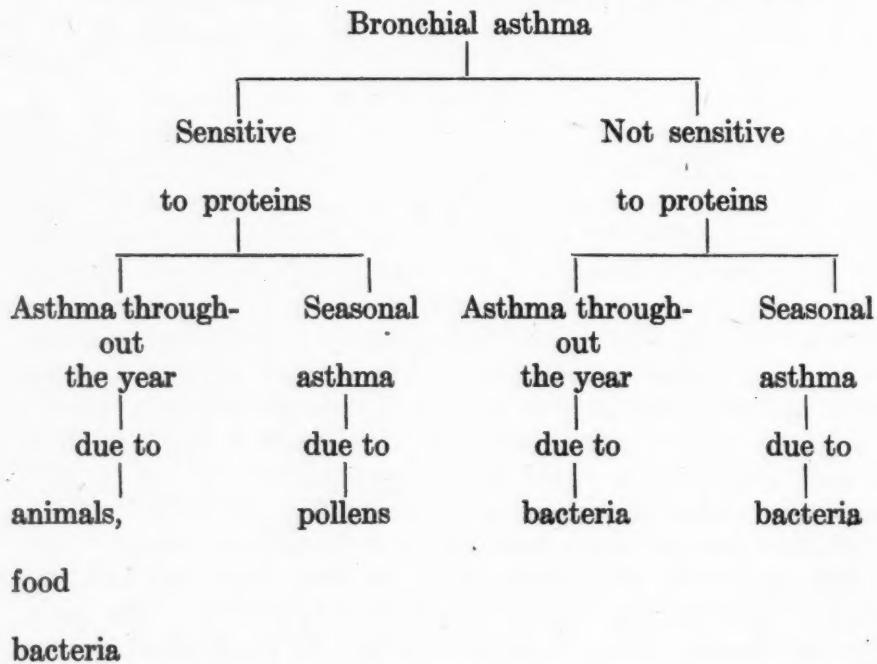
The results of dieting in those sensitized to food proteins and the results of treatment with animal hair, pollen and bacterial proteins, in those so sensitized have been most successful. And in those patients who have not been relieved by such treatment, autogenous vaccines have been of much benefit. The permanency of relief depends upon the amount of treatment and the patient's power of resistance.

The non-sensitive patient, or those who fail to give positive skin tests with proteins, may be disposed of in a few words since there is little to guide us in the cause and treatment of asthma. Occasionally the serum of such patients positively agglutinates some type of organism and treatment with vaccines of that organism frequently benefits their asthma. The non-sensitive patient usually presents the symptoms and physical signs of bronchitis, he gives a history of persistent cough between attacks, and there are râles in the lungs between attacks. Often these patients are relieved or greatly benefited by autogenous vaccines consisting of the predominating organism in their sputum. These vaccines are prepared as follows: thick sputum which is raised after a paroxysm of coughing is washed repeatedly in sterile normal saline and a portion is streaked on large surfaces of plain agar, and another portion is shaken and macerated in dextrose bouillon from which tubes of blood agar are inoculated and plated. The plain agar facilitates the identification of some organisms and the blood agar identifies the various types of streptococci. The most satisfactory results follow treatment with the predominating or-

ganism. The largest number of patients have been relieved by vaccines of *staphylococcus pyogenes aureus*, *streptococcus hemolysans* and diphtheroid organisms, when these have been the predominating ones isolated from the sputum. Other organisms may predominate and cause asthma. For instance, one patient has been relieved by an atypical type II pneumococcus, another by Friedlander's bacillus, a few by an unidentified Gram negative staining bacillus, a few by *staphylococcus pyogenes albus* and by *streptococcus viridans*; in each instance the predominating organism was the one used. Occasionally patients are troubled more from a catarrhal condition of the nose and throat than from cough, and in such cases it is often necessary to use vaccines made from these sources of infection. Naturally the teeth, tonsils and sinuses may be the seat of infection, and such foci, if present, should be attended to. In general, however, we are inclined to be very conservative in regard to operations as a relief for asthma and the possibility of sensitization to proteins should first be ruled out.

We feel that the following is a good and useful classification to use in determining the cause and treatment of bronchial asthma.

CLASSIFICATION OF CAUSES OF BRONCHIAL ASTHMA



After what has been noted in this paper the above classification needs no description. Although neurasthenic, neurotic, and psychoneurotic conditions are frequently associated with bronchial asthma, we feel that these conditions are not sufficiently often a cause of asthma to warrant a place among causes of asthma. Furthermore no provision is made for so-called cardiac and renal asthma since we do not accept shortness of breath on exertion, nocturnal dyspnoea, and bronchitis, all of which are associated with cardiac and renal disease, as bronchial asthma. The combination of all these symptoms do in a way simulate bronchial asthma, but for such a syndrome we feel that the term asthmatic bronchitis is more appropriate; such a term would infer bronchitis with asthmatic symptoms and this is really the true condition present. Cardiac and renal patients may have true bronchial asthma, however, but in these cases the asthmatic condition is entirely separate from the cardiac and renal disease; they are two distinct conditions not dependant upon each other.

THERE are about a thousand lepers in the United States. Experts of the Rockefeller Foundation estimate that there are 2,000,000 lepers in the world. In the leper colony of Louisiana there are 110 native born Americans among the patients. In Molakai, Father Damien's successor has lived thirty years without a trace of leprosy. Through the new treatment by which chaulmoogra oil is now given, patients have so far recovered that they have appeared to have no trace of leprosy for two years—which may be a step towards a real cure. At the largest leper colony in the world, Culion in the Philippine Islands, there are now 5,000 lepers. At one time there were 9,000; segregation has reduced the number to this extent.

SOME ASPECTS OF MILITARY OPHTHALMOLOGY

By COLONEL S. HANFORD, MCKEE, C.M.G.

Officer Commanding, West Cliff Canadian Eye and Ear Hospital

IT would be quite impossible in a paper of this kind to go over many important parts of this branch of military medicine, let alone the whole field. I have taken the title advisedly, knowing full well there are many sides of this subject which I shall not be able to bring to your notice. In fact, I have had to be content with presenting to you certain views on military ophthalmology which seemed to me of more than ordinary medical interest.

Military differs widely from civilian ophthalmology and varies in a wide degree, as one is at work in training camp, at the base, or in one of the various parts of the various fields. It was my privilege to undertake military duty on the day following the declaration of war, and, apart from three months' illness, I have been constantly engaged in that duty. These notes are the result of observations during that period, first in Canada, later in France, then on the island of Lemnos, and latterly at a base hospital devoted entirely to the diseases of the eye, ear, nose, and throat.

One of my first impressions at camp was how essential it was to have in a military hospital unit some one with a special knowledge of ophthalmology. One's first duty, the examination and classification of recruits, very definitely demonstrated this: "The standard of vision" has passed through many vicissitudes. When the war began it was as follows:

- (a) If a recruit can read 6/24 or better with each eye without glasses he will be considered fit.
- (b) If he can read 6/24 at the same distance without glasses with the right eye, and not less than 6/60 with the other eye without glasses he will be considered fit.
- (c) If he can read 6/24 fit the above distance with the left and not less than 6/60 with the right eye without glasses he will

Read at the Oxford Ophthalmological Congress, July 12th, 1918.

be considered fit for the A.S.C., A.M.C., A.O.C., and for drivers for the R.A. and R.E.

The standard which specified 6/24 in each eye was not a high one, and was a low standard compared to other continental armies. The result was that many men of this vision had their training practically completed except musketry. This they were not able to pass at any distance beyond two hundred yards.

This standard of vision was later modified to:

(a) If a man's vision is 6/24 in one eye without glasses and his right eye can be brought up to 6/12 with glasses he shall be considered fit for category "A".

Though the general principles regarding standard of vision may be fixed, there are many reasons why a definite standard of vision required must be altered from time to time. Comparison of methods during the South African and the present war will suffice to illustrate this. In a report of the committee appointed by the Council of the Ophthalmological Society the following is found:

"The general principles which should be taken into consideration in fixing a standard of vision for enlistment into the army are as follows:

"1. That a man's united sight should be sufficient to enable him to find his way about in bright and dim lights and be such as will prevent him from being a danger to his fellows.

"2. That he should not suffer from any progressive disease of the eye, or one likely to recur.

"These two general principles apply to all branches of the service, combatant and non-combatant."

This is indeed a generous basis to work from. Personally, I feel a standard of vision without glasses should be insisted upon, for I believe that a recruit with 6/24 vision in the right eye is a more useful soldier than a recruit with 6/12 vision with glasses in the right eye. My experience after four years is, that the man with 6/24 vision without glasses is much to be preferred.

The examination which consists only of sight testing must prove unsatisfactory. The soldier should always have a good field of vision in each eye, and his eyes should be practically free from disease. We demand that the right eye must be the good one. The general objection given for not allowing shooting from the left shoulder is the difficulty in teaching the recruit to get the necessary "rounds" per minute and that in the trenches men firing from the left shoulder are more or less of a nuisance to the

right shoulder shots. Whilst conditions are bound to change, standards of vision that have been latterly adopted seem to me fairly satisfactory. I would certainly recommend no further lowering of the standard. For it is to be remembered that one has to consider not only vision by day, but bear in mind the importance of vision by night. Sentry duty at night is of course one of the most important duties of the soldier. There are in the service men with less than the standard vision, men who are not even fit for home guard duty, passed from one service to another, and from one hospital to another in an extremely vicious circle, no one evidently with the courage, or whatever is required, to say that this man is useless in the army, get him back to civilian duty. It is so simple to pass a recruit not up to the standard, but it is exceedingly difficult to get the army rid of this man, be he as useless as possible. Lowering the standard and enlisting men who fall below the prescribed standard, does no good in the way of helping national defence. On the other hand, it does a great deal of harm, as a useless individual in the army is much more of a nuisance and does more harm than a useless individual in civilian life. The question of standard of vision is by no means a simple one, for no matter what actual standard is demanded there will always be found men with that standard who are unfit and men below the standard who are fit. So much depends upon the individual whether he is "keen" or not. I consider a soldier who is anxious to do his duty and has only 6/24 vision in each eye, infinitely more useful and a better soldier in every respect than the disgruntled one with 6/6 in each eye. There is also a certain proportion with mental amblyopia, among whom the amount of vision is not much of an indication of their usefulness. The military point of view should teach a medical officer "to size up" his patient and considerable latitude should be allowed to the military ophthalmologist as to who "sees to shoot" and who "sees enough for ordinary purposes".

There has been a demand for not one but for many standards of vision, as a standard of vision compatible with efficiency in one branch of the service would be absurd if applied to another. This perhaps is true, the drawback to it, however, is what actually happens, and that is, that a man with vision compatible with efficient service in one branch is transferred to another where his vision makes him inefficient and perhaps a nuisance. Men are constantly changed from one service to another, and in cases of great emergency, such as have occurred in the not distant past, even

non-combatant units have been called upon constantly to take up combatant duty. It has been suggested that it is easy to adopt a high standard of vision and to reject without further enquiry all recruits who fail to reach it. It is, as a matter of fact, not so easy as it may seem, I only wish it were, for, if the standard of vision had been adhered to, I feel sure millions would have been saved to this country. Lowering the standard of vision will increase the number of passed recruits marked "fit for service", but it will not increase the number of bayonets, and it will very materially lower the efficiency of the army. Anyone who believes it is easy to adopt a standard and reject all recruits who fail to reach it, please note the following few cases taken here and there from hundreds:

Pte. P. H.—Right vision, 6/36 not improved. Left vision, 6/60 not improved. Diminution of vision due to amblyopia from a high degree of astigmatism.

Pte. W. C. W.—Right vision, 6/60. Left vision, 4 to 8 feet vision.

Pte. R. R. H.—Right vision, fingers at two feet. Left vision, 6/60. Astigmatism and amblyopia.

Sgt. F.—Right vision, 6/60. Left vision, 6/36. 5 diopters astigmatism right eye and 4·5 in the left.

Pte. A. B.—Right vision, 3/60. Left vision, 3/60.

Pte. G. B.—Right vision, no perception of light. Left vision, 6/36.

Pte. A. W.—Right vision, perception of light. Left vision, perception of light. Myopia 25 to 30 diopters.

Pte. H.—Right vision, 6/36. Left vision, 6/24. Amblyopia from astigmatism. This man has been under military pay for eight months.

Pre. B.—Right vision, 6/36. Left vision, 6/36. Convergent strabismus, nystagmus.

Pte. T.—Right vision, 6/36. Left vision, 6/36. This man was removed from the ranges as dangerous. One can well imagine what he would be under more trying circumstances.

Pte. J. H.—Right vision, 6/36. Left vision, 6/36. 5 diopters of astigmatism in the right eye and 6 in the left.

Pte. J. H. O.—Right vision, fingers at 2 feet. Left vision, 6/36.

Pte. F. H.—Right vision, 6/60. Left vision, 6/60. Retinitis pigmentosa.

Pte. A. F.—Right vision, 6/36. Left vision, 6/36. Old trachoma with panus.

Pte. L. J. K.—Right vision, 6/60. Left vision, 6/60.

Pte. H.—Right vision, 3/60. Left vision, 3/50.

Pte. B. R.—Right vision, 6 to 8 feet. Left vision, 6/60.

These details may surprise some of you as examples of some of the individuals who have been passed fit for military service. These men are absolutely incapable of any military work, but rest assured they will all be fully capable of attributing their disability to service, and demanding a pension when that time comes. From the low standpoint of cost, this is a large question. Take for instance the following cases:

Pte. F. J. B., twenty six years old, 32/12 service. Ten months ago, whilst in France, this man began to be troubled with headaches and with difficulty in seeing at night, and for this he was evacuated to England. Upon admission to hospital, right vision is 6/36, left vision counts fingers at one foot. Examination of the fundus shows marked disseminated choroiditis in each eye, more marked in the left. There is no history of illness previous to enlistment except malaria five years ago. He says the left eyesight was "poor" on enlistment. Wassermann negative. How much of this man's present disability is due to service, and how much of his disability is pensionable?

Spr. N., after some months' service in France was admitted to hospital April 11th, 1918. Right vision, 6/24, left vision, fingers at three feet. In the right eye there are several patches of choroidal atrophy, in the left eye extensive vitreous opacities. He claims his vision was good on enlistment, the fundi, however, show a condition which looks like an old one. Wassermann negative, urinalysis negative. This man is unfit for service and must be discharged. How much of his disability is due to service and what pension is he entitled to?

The medical officer who lowers the standard and passes an unfit recruit does his country harm from more than one point of view. The military medical officers should have the assistance of an ophthalmologist, or someone competent to say what eyes are diseased, and what eye conditions are incompatible with efficient service. Medical officers should be competent not only to estimate the amount of vision, but they should be instructed in the essential details in this respect, and be competent to give an opinion as regards an eye whether healthy or pathological. The Canadian

Medical Service has been far in the vanguard in this respect. The appointment of an officer specially qualified in ophthalmology to a position in a field ambulance, to attend to special work in certain areas, marks a big step forward in military medicine. Unfortunately there are still many specially trained medical officers who are enshrouded in that wondrous work "Administration".

In military, as in civilian ophthalmology, a considerable percentage of one's work consists in the estimation of the errors of refraction, and work relative thereto, and in this part of one's duty, it is most essential to get the military point of view. And by this I do not mean to regard almost every patient who appears as a malingerer, but for one to understand that in military life one is dealing with individuals, a certain percentage of whom are not averse to avoiding duty be that even a pleasant one. In civilian life one is consulted in the hope that a proper remedy may be supplied and consequently has the whole hearted assistance of the patient. In military life the soldiers are often individuals who wish to avoid work and duty, who, to give it the soldiers' term, are "swinging the lead". One needs to be very much on the alert in examining such cases, as a great deal depends on the personality of the medical officer. To be hasty with men of this class is to defeat oneself. The best method of dealing with them is to deceive them as to your knowledge of their case as they are deceiving you, or think that they are, as regards their complaints. When one finds a low visual acuity without any evident cause, suspicion is of course aroused, but whether it is the patient's manner or not, almost invariably there is something which tells one this patient is not telling the truth. Unless a soldier's vision is improved considerably by glasses, he will not wear them, so that there is only one reason which warrants prescribing glasses for a soldier, and that is that by prescribing glasses you change him from an unfit to a fit soldier. To my mind there is no other excuse which warrants putting glasses on a soldier, for it is to be remembered that if a soldier can get along without glasses he will, especially since gas masks have come in vogue, and it is a grave mistake to prescribe them, for when you do, you supply him with an excuse which he always has with him for lining up on the sick parade. A man who breaks his glasses or a man wearing glasses who complains of headaches is immediately sent away for examination, and immediately avoids a duty which he did not wish to perform. It does not matter whether his refraction was finished only a few days previously or not. Medical officers have learned well to associate

headaches with errors of refraction. It is to be remembered that in a soldier complaints of headaches or pains of any sort are not reliable symptoms of disease. I opened two mastoid processes in France before I found out that pain was not a reliable symptom of disease, certainly not in a soldier wishing to get to "Blighty". Again in the healthy out of door life of a soldier, errors of refraction should not cause headaches. Pains in the head of all kinds, photophobia and night blindness are frequently complained of, the actual defect seems to be the last complaint thought of. Amongst soldiers one finds a tendency to exaggerate a natural defect, so that the estimation of the real error is by no means simple. The patient may have worn glasses for astigmatism or for a small degree of myopia before enlistment and then discarded them. It is difficult to get such patients to admit improvement in their vision, even with proper lenses, and, as suggested, the detection of this obstinacy is sometimes exceptionally difficult. I consider the wholesale refraction of troops and the supply of glasses to combatant forces a grave mistake. Where glasses are ordered, I feel they should be as simple as possible. It is a grave mistake to give a soldier with normal vision lenses correcting small degrees of astigmatism and hyperopia.

Pte. C. Q. has right vision 6/18, left vision 6/12, each eye with cylindrical and spherical plus one, corrected to 6/9 plus. With both eyes this man had 6/6 vision, but returned within a month to say that "he could not see with his glasses".

Pte. M. came complaining of headaches and dizziness. Dizziness has now become a fairly common complaint, as it has been found out that this is a symptom which promises well as regards the object desired. There was no error of refraction, fundi were normal, with a plus and minus two before each eye his vision was normal.

Pte. H., right vision 6/5, left 6/18. He had been prescribed a plus one right eye and plus three for the left. This man had served a long while in France without glasses. There is hardly an indication to supply glasses here in civilian, let alone in military practice.

Pte. G. W. A. came with marked photophobia, he had 6/60 vision in each eye which can be improved to 6/36 and 6/18. As is usually the case, this man says he is unable to wear the lenses as they hurt his eyes and do not help the constant "blinking".

During the examination for refraction one finds a variety of defects, prominent among them amblyopia exanopsia. If these

cases have slipped through the examiners and have been overseas, the blindness is almost always attributed to overseas service. Where there is a large degree of astigmatism, the probability is that the amblyopia is of long standing. Squint, scars on the cornea, myopia and astigmatism help to place the amblyopia as old, but latterly after having observed the pranks of high explosives on the shape of the eyeball, I am very careful in coming to a hasty conclusion. From observation I feel sure that I have seen cases of men who have had normal vision before proceeding to France, and who, from the effects of high explosives are now men with a high degree of myopia. Cases have also been seen of very high amounts of astigmatism, five or six diopters in each eye. These patients in civilian life were at such work as engine drivers where routine examination of their vision was made. They say it would have been impossible for them to have carried on their civilian work with such visual defects. There is no way I know of to explain this defect, except from high explosives.

P. D. was blown up by a shell in August, 1916; right and left contusion of the eyeball. On admission, right vision was 6/36, left vision 6/12; the right disc was badly cupped, this has gradually disappeared. There remains right vision 6/36, with a high degree of myopia and astigmatism with normal fundus. Left vision normal. This man is positive that his right eye has been affected only since his being blown up.

The following is a typical case: Pte. McC.—This man says his sight was good before going to France. There is certainly no doubt that it must have been very much better for him to have got to France. On April 4th, 1917, he was operated on for gunshot wound in the head with fracture of outer table. Right vision 3/60, left 6/60. With minus seven each eye, vision 6/24. No fundus changes.

One day I was called to the throat clinic to see an ear case, a patient who had been deaf and dumb for several months. He had not been overseas. After getting the history of the case, I examined him in the usual way. When I had finished I said to the medical officer whilst looking right at the patient, "This man hears as well as you do, report him a malingerer." The man went back to his battalion and reported that he had been "faking" all this time. The malingerer who comes to the hospital with the intention of deceiving you is a nuisance indeed. It is surprising the amount of your time he can waste. "A malingerer is one who is not ill and pretends that he is, if he *bona fide* thinks he is ill, he is

not guilty of that pretence." When your suspicion is aroused, most of these cases are detected by Snellen's letters. Some of this type, however, are almost uncanny in their ingenuity, and their mental outlook needs to be studied very closely. Some maintain malingeringers can only be successfully dealt with by strong measures, such as the faradic current. The malingeringer may stand one or two applications, but he cannot face the prospect of a daily repetition and so he quickly gets well. With functional cases one needs to be very patient, they resent, perhaps properly so, being told they are malingeringers and resent it keenly. I remember in the early days of the war examining a patient who had to be led into the clinic, but who with a plus and minus six could read 6/6. I made a note on his chart that he was a malingeringer. Some enthusiastic chum of his read it to him. He felt very keenly on the point. He had volunteered originally; he had been overseas, wounded, returned to Canada, had given up a good position a second time and re-enlisted and been to France again. Nevertheless there were the facts, he could read 6/6 with a plus and minus six, although he had to be led into the clinic. It was with the greatest difficulty that I restored his peace of mind.

The patient with functional amblyopia, war neuroses, or whatever name you wish to give it, is entirely different. Some of these are pathetic in the extreme. In dealing with cases of this class the first thing obviously to do is to decide whether you are dealing with disease, a functional condition, or malingering, and here it might be well to remark that it is a mistake to think that all malingering is the outcome of deliberate wickedness. Moral responsibility is a variable quantity, and great allowance has to be made for the personal equation. The patient with functional amblyopia is much easier to diagnose than the malingeringer. A method with which I have had great success is as follows: One eye is examined at a time and the vision recorded; this may be anything from hand movements to 6/24, seldom above it. A plus six is then placed before the eye and the patient is asked whether that blurs his vision or not; the answer is generally that the vision is more blurred; a minus one is now added, then minus two, and three, and four, and five and six, slowly and at the same time encouraging the patient whose vision has been improving with the application of each lens so that at the time that we have a plus and minus six before the eye he reads 6/6. This method has proved most satisfactory where the blindness complained of has been of one or of both eyes and also where the dimness of vision has been

only one of degree. When the diagnosis is established, treatment must vary accordingly, and here much depends upon the individual you are dealing with and how you have sized him up, and perhaps what impression you have made upon him. Rest in bed, with a sedative, for a few days nearly always improves these cases. Sometimes widely dilating the pupils is a beneficial measure. Easton's syrup, baths, light exercise generally suffice to bring about a cure. On the other hand one meets from time to time with cases that are exceedingly refractory.

Spr. G. W. R., aged twenty-five, with three years and five month's service, was gassed in December, 1917, when his face was slightly burned. He was evacuated from France and was admitted to West Cliff Hospital on February 18th, with a history of having been blind since the day after he was gassed. The pupils and the fundi were normal; vision of each eye acknowledged was not more than perception of light. With a plus six and a minus six the patient would only admit 6/60 vision. He was put on Easton's syrup, drops sulphate of zinc, 1 per cent. (they generally derive more benefit from drops that sting slightly). Two weeks later the vision had improved with the above lenses to 6/36 in each eye. We had at West Cliff at this time a number of blinded patients who were about to proceed to St. Dunstan's Hospital. The patient in question heard so much about St. Dunstan's he evidently made up his mind he was going there. He had to be led about, he started to study Braille and he was most persistent that he be sent to St. Dunstan's that he might learn a trade. To remove him from the "blind" atmosphere I had him transferred to another Canadian hospital, where cases of war neuroses are treated. Being interested in this case I wrote to the Officer Commanding a short time afterwards, and the following is part of his reply: "The day following his admission he was given three minutes' treatment with the faradic wire brush and at the end of that time admitted he could see quite well. Since that time there has been no tendency to blindness and he will shortly be discharged to duty."

Lieut. M., aged twenty-two years, with six months' service in France, was wounded May 10th at F—, slight wound in the arm. He was also buried for some minutes at this time. He was invalided from France and has been in a number of hospitals, and although he noticed in France that his sight was failing, it was only while in hospital in England that he suddenly found that he was completely blind. He was admitted to West Cliff Hospital October 13th, 1917. Vision of about 2/60 in each eye, not improved, no fundus or organic

disease. He was put upon Easton's syrup, rest in bed, etc., being taken out daily for a walk, and led about by a friend. Three days later the vision was fingers at two feet in each eye, with plus and minus six, 6/24; two weeks later his vision had improved to 6/18 plus; two weeks later his vision with these lenses was normal in each eye. When it was explained to him that the glass that he had in front of his eye was very weak, he was convinced that his vision was good without glasses.

Whilst tests for vision and refraction form a large part of military ophthalmology one finds in camps the ordinary civilian complaints, the usual number of accidental injuries, ruptured globes, the usual material of a good clinic. One feature of cases seen in camp was the large number of phlyctenular conjunctivitis cases in adults, and the large size of the phlyctenules; I have never seen anything approaching them in size. I have not seen an epidemic of conjunctivitis amongst soldiers and very few cases of gonorrhoeal ophthalmia. Trachoma or *Ophthalmia Militaris* of the last century has almost disappeared as a military disease. The importation of labour into our army from the East may, however, alter this. The absence of an epidemic of conjunctivitis and the absence of trachoma is of interest considering the condition of Europe during the Napoleonic Wars. Historically it may be of interest to recall to your mind the fact that Hannibal's army was incapacitated for one winter in Italy with ophthalmia. Following the original gas attack in France in April, 1915, there was a large number of cases of conjunctivitis. I was struck with the sequela of iritis in a number of these cases, and in discussing this matter with Professor Morax, he had also noted this. Evacuation was being carried out so rapidly, however, it was impossible to follow up this point. The mustard gas conjunctivitis of the present day is a condition marked by intense and persistent photophobia with marked blepharospasm and severe lacrymation. It is most persistent in its course and not infrequently leaves behind it macula cornea and a persistent blepharitis or eczema of the lids. In early cases an oily lubricant is beneficial and grateful, with drops of cocaine and adrenalin, this to be followed later on by some astringent drops such as sulphate of zinc. I dislike supplying dark glasses to these cases as in many of them the functional element is very apparent, and it is quite difficult to get the patients to do away with the dark glasses after he has been wearing them for a little while. Conjunctivitis has been seen associated with dysentery enough to excite notice. Whilst in the East, recovering from

dysentery, I, myself, developed a severe conjunctivitis. This was prodromal to an acute rheumatic condition. The appearance of a severe metastatic conjunctivitis preceding an acute rheumatism has been noted.

Amongst military symptoms of disease night blindness takes a prominent part. It has been frequently met with, and in a number of cases has been associated with true retinitis pigmentosa. Nyctalopia in soldiers has been put down by some as a symptom of neurasthenia. This, I think, is a mistake, from the cases that have come under my observation.

Functional night blindness was well recognized before the war, and nyctalopia has been reported as endemic in certain countries, especially in Russia during the Lenten fasts. It seems to me, we may well attribute this complaint or disease in a certain number of cases to exposure with the hard work and great fatigue consequent on service. There is, however, no doubt in my mind that many soldiers have heard a chum complain of night blindness with the desired result, and have then gone and done likewise. A clever malingerer finds it an easy complaint to simulate, and one the simulation of which is hard to detect.

The result of Wassermann reactions amongst individuals of military age may be of some interest. In one hundred and five cases of iritis, the reaction was positive in thirty-three and negative in seventy-two. These are remarkable figures when one considers the age of the majority of patients and the relationship between venereal disease and active service. In four cases of retinitis pigmentosa the reaction was negative; in eleven cases of optic neuritis, five were positive, six negative; in seven cases of interstitial keratitis the reaction was positive in all; in thirty cases of retino-choroiditis, fifteen were positive and fifteen negative. In the CANADIAN MEDICAL ASSOCIATION JOURNAL for November, 1916, Captain H. G. Courtenay and the writer reported on a number of cases where eye lesions, such as iritis, optic neuritis, and retino-chorocditis had appeared in soldiers who had had a full course of arsenical and mercurial treatment.

Lieutenant W. L., aged twenty-two years, consulted me in May, 1917, on account of the loss of vision of his left eye. He had been infected in December, 1916, for which he had had a complete course of treatment of both arsenic and mercury at one of the military hospitals. Upon examination the right eye was found to be normal, the left vision fingers at three feet due to dense opacities in the vitreous which prevented a detailed examination

of the retina. Upon inunctions of mercury, hot baths, and hypodermic injections of pilocarpin, his progress was steady and satisfactory. At the end of one month the vitreous had cleared so that the retina could be seen and the dimness of vision was found to be due to haemorrhages in the macular area. His vision was then 6/36.

Bdr. J. D. came to the clinic in June, 1917, with a gumma of the right iris; this after a full course of arsenic and mercury.

Sergt. G. C. F. reported to the clinic with a retinal choroiditis syphilitica. He had recently finished treatment extending over one hundred and sixty-seven days.

Pte. S., aged thirty years, service 31/12, reported at the clinic on March 24th, with right and left vision, fingers at one foot. Examination showed very severe retinal choroiditis in each eye. This man had only finished a course of arsenical and mercurial treatment in January, and in February had a negative Wassermann. Under inunctions of mercury his progress has been steady. At the present time his vision in each eye is 6/18.

The treatment of syphilis of the eye will always, I presume, be a subject of more or less controversy. Each one, however, must profit by experience; and I prefer to treat such cases to a conclusion for their eye condition, and then hand them over to a venereal expert for further examination and treatment if necessary. To my mind, syphilis of the eye reacts better to treatment by inunctions of mercury than by any other.

Among roughly three thousand ophthalmic cases admitted to West Cliff Eye and Ear Hospital I have seen two cases of sympathetic ophthalmia.

Pte. G. was wounded June 4th, 1917, at V—, in the right eye and right shoulder. The right eye was removed on June 26th. On July 28th, he first noticed his left eyesight failing, and on July 31st he was admitted to West Cliff Hospital, service of Captain Newbold Jones, with a well marked sympathetic ophthalmia. The iris was injected and adherent to the lens capsule at four points, punctate keratitis, dustlike opacities of the vitreous, and optic neuritis. The eye was bandaged and he was put on systemic treatment of salvarsan and mercury and local treatment with atropine. The eye quieted gradually, the iris assumed a normal appearance and position, and on December 18th his vision was normal, eye quiet.

Colonel V. K., aged sixty-one years, was injured in the left eye on September 27th, 1916, and admitted to hospital that day. In spite of constant ice compresses, the eye on the morning of October 18th was slightly painful to pressure and was enucleated

the same morning. He was discharged from hospital on October 30th, the right eye normal with vision 6/5, the whole line. During the following week he developed a sympathetic ophthalmia and was treated outside by excision of the stump of the optic nerve and salvarsan. Some weeks later he was seen at this hospital, he had completely recovered and had normal vision.

During routine examination many interesting congenital conditions of the fundus have been seen. The concussion following modern explosives leads to a great variety of fundus lesions. This subject has been taken up by a number of writers in this country as well as abroad. The injuries are caused by the violence communicated through the bones of the skull, the bones of the orbit, or by air vibration—windage. The most remarkable part of this study to me, was to see the serious damage which could be done to the eye, due entirely to windage and where there was apparently no injury caused to the sclerotic coat. Lagrange has recently published a war atlas dividing the fundus lesions into groups and defining rules governing disorders of this kind. He says lesions by concussion are seated at the posterior pole and especially in the macular area, and secondly that the lesions by contact are always in front of the orbital fracture or at the very spot where the missile could graze the eye; that the lesions by concussion are choroidal and those by contact chorido-retinal. He describes a condition which he calls traumatic proliferating chorido-retinitis, which is the result of organization of the blood extravasated up to the superficial layers of the vitreous through the lacerated retina. We have seen a great variety of these different fundus lesions.

Pte. E. C. L., wounded at P—, October, 1917. Externally the right and left eyes uninjured. The left eye below shows a large rupture of the choroid with retino-choroiditis proliferans; the right eye shows a small rupture of choroid to the temporal side and below—the chorido-retinal changes from contact.

Pte. W. D. S., wounded below the margin of the right orbit, fracture of the malar. Left vision, 6/9, right vision, perception of light. The right fundus shows below the border of the disc a large rupture of the choroid with numerous areas of displaced pigment—another chorido-retinal condition from contact.

Also Pte. W. H. F., wounded in the head, fracture of the frontal bone. No external injury to the eye. Fundus shows small rupture of the choroid below the macular area, displacement of pigment above and to the outer side and a pepper like appearance in the macula.

Sergt. R.—In March, 1917, this N.C.O.'s gun was hit and there was tremendous "windage" to the right side of his head. He was evacuated for wound in the foot. He soon began to notice spots before the right eye. Externally this is normal. Toward the periphery of the nasal side of the disc there is an area about one and a half times the disc of displaced choroidal pigment, also dustlike opacities in the vitreous. Right vision 6/36, left vision normal. Choroiditis from concussion.

Co. S.-M. B.—This N.C.O. had on March 9th, 1918, a fall from a bicycle injuring his head. Notes on the case state that he fractured the temporal bone at the external angle of the orbit. On recovering consciousness he had only perception of light in the left eye. This had not improved since. Right vision, 6/6, left vision perception of light. The left fundus shows primary atrophy of the optic nerve.

One of the commonest lesions of the fundus which I have met with and which I have not seen described anywhere is a condition of traumatic-retino-choroiditis characterized by diffuse cloudiness of the retina, numerous small exudates in the choroid and fine dustlike opacities of the vitreous. It is identical with retino-choroiditis of secondary syphilis. It varies in degree from a very slight opacity of the vitreous to diffuse thick opacities with changes in the choroid. I have seen a large number of such cases where I am positive the changes were due to trauma-windage.

Pte. V. was buried on the S.—Right vision 6/6, left vision, hand movements; left vitreous full of dustlike opacities, retina cloudy. Wassermann negative. A typical case of traumatic retino-choroiditis, which has been by far the commonest form of traumatic lesion of the fundus that I have seen.

Pte. F., thirty-four years of age, was blown up on March 2nd, 1918, since which time the sight of his left eye has failed perceptibly. Prior to this accident his vision was good, but since the explosion it has been failing, so that at the present time he has left vision, fingers at two feet; right vision, 6/6. In the region of the macula he has a tiny patch of choroiditis, dustlike opacities. Wassermann negative.

Gnr. J. K.—is an example of a typical case of traumatic retino-choroiditis. He was blown up at W., luckily he was not injured in any way except that he could not see so well with his left eye. Upon admission shortly afterwards to West Cliff, right vision was normal, the left vision 6/36. The optic nerve is obscured by dust-

like opacities in the vitreous; there are some tiny opacities also in the lens. Wassermann negative.

Corpl. M. was admitted to hospital complaining of diminution of the right eye; this had followed an injury received in France when he was blown up. Right vision, 6/24; left vision, 6/9; dust-like opacities in the vitreous with definite choroiditis to the nasal side of the disc. Wassermann on two occasions negative.

Pte. R., forty-five years old, was hit by a piece of falling timber on the head and right shoulder in March, 1918, and a few days later he noticed the right eye was practically blind. When admitted to West Cliff, right vision, 3/60; left vision normal, right eye retino-choroiditis traumatica, left eye normal.

Surgery forms one of the most interesting parts of military ophthalmology, though many of the operations of civilian practice are not met with at all. One reason, and one reason alone, should form the basis for all military operative work—necessity.

It is most unwise to correct strabismus, for instance, for cosmetic reasons, or to do any operations of a similar nature. If a recruit is accepted for service with a disability of this kind, and an attempt is made to correct it, he first becomes a hospital patient without being ill or wounded (in itself most undesirable), and, secondly, he is given the starting point for an attempt to obtain a pension. Dacryocystitis is not infrequently met with in military work, and for military purposes, and the same would hold among industrial workers in civilian life, I can very strongly recommend the West operation. By this, after elevation of the mucous membrane and chiseling away the bone over the lacrymal sac, the nasal wall of the lacrymal sac is cut away. An artificial communication with the nasal cavity below the inferior turbinate is thus established. Faulty drainage is corrected immediately and the result is most satisfactory. With Captain C. W. Graham, C.A.M.C., the writer has done a number of these operations and the result has been most satisfactory, especially so for military personnel where syringing, probing, etc., are inadvisable and where the epiphora after excision of the sac gives the individual a constant disability.

Lieutenant L., forty-three years old, came to hospital complaining that he had had a dacryocystitis, right and left, for some months. He was treated by syringing for three weeks, and although improved by this, the epiphora remained enough to be troublesome. Within a few days of each other a right and left intra-nasal drainage operation was done with most satisfactory

results. He was discharged to duty thirteen days later. He came to see me some months after, whilst on leave. He had not had any further discomfort with his lacrymal apparatus.

This typical case is cited to show how quickly this method will enable one to return a man to his work, which after all is a medical officer's first duty. In one case we had some difficulty with post-operative adhesions, and subsequently used a celluloid splint for a day or two, a splint such as is used in sub-mucous resection.

While eye injuries in the Chino-Japanese War of 1894 form only 1·2 percentage of all wounds, it will be found that they take a much larger percentage in this war. The terrible face injuries of Armageddon has placed before us the opportunity for wonderful development in plastic surgery of the face. For the repair of damage to the orbital walls Lagrange gives three mothods:

1. Metallic plates.
2. Adipose grafts.
3. Cartilage grafts.

He quotes Morestin extensively in giving the history of cartilage grafts and emphasizes that he has erred in trying to do too much at one operation. He first does a blepharo-plasty and six weeks later introduces under the skin the necessary cartilage and celluloadipose tissue. Another more useful purpose to which cartilage is being put is its implantation after enucleation or evisceration of the eye. The restoration of the eyelids by frontal or malar flaps has proved most satisfactory. Enlargement of the conjunctival cul-de-sac has always been a difficult matter and one not always approached with pleasure. "Magitot covers a piece of metal with an epidermis flap and introduces this into the orbital cavity in such a manner that the lower surface of the flap is applied to refresh the surface of the inner aspect of the eyelids." Lagrange uses Snellen's sutures and reports great success from this method. In the *Annals of Surgery* for March, 1917, Esser has given us his "Studies in Plastic Surgery of the Face". The procedure for enlargement of the conjunctival sac is described there as follows:

"The enlargement of the conjunctival sac is very often required to make room for the eye prosthese. In these cases the eyelid skin is then cut parallel with the eye slit, higher or lower according to the case; generally scars must be taken away. And now, after lifting the upper part of the cut, an impression can be taken (best with the assistance of a dentist) with sterilized wax material. This, after hardening, is carefully surrounded in the

described manner with very thin Thiersch, which is then placed in the wound, and closed with pressure.

"The mould must be made in a manner and with such pressure that its size is such that afterwards, on sewing the wound together, sufficient tension results. Before cutting the Thiersch, which only takes place when everything is prepared to receive it immediately, without first placing it in a physiological solution, the hollowed mould must be placed in the hollow and the incision pressed together with the fingers, to see if the tension is correct, otherwise the mould can be altered. It is not practical to enlarge it by adding to it, as the join leaves a line where the Thiersch later on falls in, but it is better to make a new mould if the first prove too small. It is possible to decrease the size if too large, by cutting before it is quite hard and softening down the cuts.

"The closing under pressure by the sewing is necessary for two reasons—first, the Thiersch is pressed everywhere for quick healing, and second, possible bleeding is prevented. Though I construct the hollows by cutting on purpose to open the most possible number of little blood- and lymph-vessels (by all free transplantations, I prefer this method to the blunt preparation in general use, because it gives better healing condition). By sewing together under pressure, the small vessels are all closed—only the large arteries must be squeezed or twisted, but not tied, as no foreign substance may remain between inlay and wound. In consequence of the pressure a primary healing of the suture is not sure, but mostly of less importance as an ugly scar can be easily corrected afterwards. After about two weeks the conjunctival sac is cut parallel to the eye split, and at such a distance from it where the inlay is nearest to the surface. The mould is removed and the smoothly healed hollow is annexed to the eye hole in order to receive the eye-prosthese, which must be placed directly so that the still elastic hollow can adapt itself to the prosthese form. It is now clear that the hollow must be constructed everywhere as near as possible to the mucous membrane."

Esser, in his article, forecasts considerable increase in the types in which this method will be useful, and already most valuable progress has been made in this respect. Major C. W. Waldron, C.A.M.C., first undertook charge of the face injuries' service at West Cliff Canadian Eye and Ear Hospital. This service, in need of greater space, was later moved to a Canadian General Hospital and later to "The Queen's Hospital". Majors Gillies, R.A.M.C., and Waldron, C.A.M.C., have enlarged on Esser's methods and

given us a most valuable means of remedying many of the war distortions of the lids by a method of epidermic outlay as compared with Esser's epidermic inlay. Waldron has modified Esser's method by making the incision in the conjunctival sac instead of through the eyelid skin; an impression compound mould is made, covered with the skin graft and buried in the manner described, except that over the mould are sutured the cut margins of the conjunctiva. Waldron suggests undercutting the tissues of the cavity a little so as to make the cavity somewhat larger than the desired enlargement of the sac. He also suggests that in many cases it is found difficult to make the incision close to the Tarsus. In making an inferior fornix he overcomes this condition by making the incision outwards and slightly downwards for a distance of one cm. from the external canthus. This modification has the following advantages, in his words:

1. Unnecessary scarring of the eyelids is prevented and the normal elasticity of the skin not impaired. As it is not uncommon to have an accumulation of serum develop around the buried graft, sutures may give way and slight infection may take place without impairing the success of the graft. These minor complications, however, in the case of inlays buried through an incision in the eyelid skin, may lead to granulations and scarring, and in rare instances epithelialized fistulae have developed necessitating operative excision and closure.

2. The exact position of the new fornix may be better outlined by an initial incision through the conjunctiva than by the undercutting to a point just beneath the surface of the conjunctiva. In our experience, the fornix may be made closer to the tarsal plate by incising through the conjunctiva.

3. The depth and direction of the cavity can be readily determined according to the necessity of the individual case."

Major Gillies, R.A.M.C., has made two modifications of the Esser process. The first method consists in the graft covered mould being buried in the subcutaneous tissues of the eyelid through an incision in the skin and is removed through that incision. By this method the eyelid skin is increased to the extent of the graft. This is especially useful in contractions following burns. The second method may be termed an epithelial overlay. Here, extensive undercutting may be necessary before the remains of the eyelid can be brought to the normal position and the covering in of a graft covered mould is impossible. "After the remains of the eyelid have been sewn in a favorable position, scars excised and an

impression taken of the entire raw area, a Thiersch is then applied to the raw area and held firmly in place by means of the compound impression. This may be left in position for ten or twelve days. By this procedure the employment of pedunculated flaps may be avoided in many cases."

Pte. M. W. was sent to West Cliff for repair of his right socket to enable him to wear a glass eye. After the usual preparation, and under an anæsthetic, an incision was made along the lid margin the entire length of the damaged third of lid, the edges were separated and dissection was continued to a depth thought necessary. The cavity was then fitted with a mould of sterilized dentist's compound and sutures loosely put in place through the lines of incision. When the compound had been pared to the proper size, a Thiersch graft was obtained from the arm and wrapped around the compound with the skin surface next to the compound. This was then placed in the cavity, which had been thoroughly dried, and the sutures were drawn so as to keep the compound firmly held within this cavity. Ten days later the stitches were removed, the compound taken out, the graft had united entirely, the desired line of the lid had been repaired and the patient able to wear a glass eye.

Spr. W. M., service of Captain W. E. Ainley, with left anophthalmos, was unable to wear a glass eye on account of the shallow nature of the lower conjunctival cul-de-sac. Line of incision along the lower palpable conjunctival sac was made, an epithelial inlay set in, on compound and sutured, the compound was removed ten days later, the epithelial inlay had entirely taken and made the wearing of a glass eye a simple matter.

These two cases will perhaps suffice to give you some idea of what can be done in the repair of the lids by epidermis inlay and outlay. These methods offer much to ophthalmic surgeons. The results obtained in extensive ectropion following burns, by the epidermis outlay, technique of Gillies, are most satisfactory. Equally so are the results obtained by the epidermic method of Waldron in injured lids and in shallow and distorted conjunctival sacs. The development of military ophthalmology along these lines has been extensive indeed. The repair and even the reformation of the whole lid as well as the repair of the conjunctival cul-de-sac by the Esser, Gillies and Waldron methods, marks an epoch in ophthalmic surgery.

The subject of military ophthalmology is so large I have only been able to touch here and there on some of the essential features. I hope, however, that I have been successful in drawing your

attention to what an essential part of military medicine ophthalmology really is.

It is to the credit of the Canadian Army Medical Service that at a very early period of the war the necessity for a special hospital was noted, and that in October, 1915, the West Cliff Canadian Eye and Ear Hospital was opened with a capacity of one hundred and five beds. There were three administrative and four medical officers, ten nursing sisters and twenty-seven other ranks. From that beginning the hospital has increased until at the present time it has an establishment of four hundred beds, twelve officers, and forty nursing sisters. There have been admitted to hospital, 9,854 cases and there have been 49,906 consultations in the out-clinic department. Here are prepared the special reports so essential to medical boards, for categorization, for pensions and for the final disposal of men. Much credit is due to Colonel J. D. Courtenay, of Ottawa, who by his initiative had a great deal to do with the establishment of the hospital. By his persistence he saw that it was properly equipped, and by his foresight made the necessary accommodation for its possible growth. The hospital was originally intended to be the head of the Canadian ophthalmic service where civilian ophthalmologists would be sent for military training. Unfortunately, war time is one of changes. We are, however, practicing military ophthalmology in as conservative and in as scientific manner as possible. We have all the equipment, including library and laboratory, necessary for such work and hope a sufficient number of civilian ophthalmologists are being trained for useful military duty. These officers will later be looked to, to decide many important questions. What eye injuries and diseases are due to service? What is the relationship between wounds of the cranium and defective vision? Soldiers with loss of central vision and no macular changes, is this due to service and is it pathological or functional? What injuries are due to "windage"? What is rational treatment for malingering, functional amblyopia, war neuroses? What is the amount of disability due to hæmianopsia? All these, of a professional nature, and more, and many medico-legal ones are questions which must be decided by us with fairness to the individual and to the State.

ADMINISTRATION OF ARSENIC IN SYPHILIS

BY MAJOR W. T. LOCKHART, C.A.M.C.,

AND

CAPTAIN J. R. ATKINSON, C.A.M.C.

Canadian Special Hospital, Whitley

AT a recent representative meeting of the British Medical Association the chairman, Mr. E. B. Turner, F.R.C.S., referring to venereal disease, drew attention to the wide dissemination of syphilis which would be particularly apparent after demobilization of the troops, and he urged that general practitioners should prepare themselves for the treatment of this disease by modern methods.

The educated portion of all civilized nations is becoming more and more alive to the enormous influence which syphilis will have on the future well being of the nation and to the tremendous increase in the dissemination of this previously world-wide disease, due to the great war. Measures of prevention are now freely discussed in places where a short time ago the mere mention of venereal disease would have caused shocked consternation. With this awakening there will come a demand for the sole effective means of prevention, which consists in the sterilization by treatment of infective cases so that they no longer constitute foci for the dissemination of their disease.

It has been observed that syphilis is the most protean of diseases. Its manifestations in individual cases are as varied as humanity itself, and it is scarcely to be expected that the general practitioner will have time or opportunity to thoroughly familiarize himself with all of them. There will always be room and work for the specialist, but the general practitioner should be able to recognize the more obvious cases, which are those really dangerous to the public, and by the method introduced by Ravaut and Thibierge and referred to in this paper, he can treat the majority of them far more satisfactorily than he can most of the other ailments with which he has to deal.

One of the chief objections appears to be that raised by a London doctor in a recent letter to the *British Medical Journal*, in which he complained that the technical apparatus required was elaborate and expensive, as well as being troublesome to manipulate. In the majority of clinics this is quite correct, for they still use the gravity apparatus and dissolve the arsenic preparations in large quantities of distilled water, besides having a considerable amount of normal saline solution in the alternate tube for the purpose of indicating that the needle has penetrated the vein and for washing out the portion of the dose below the "Y" tube at the completion of administration. This method of administration necessitates a special still and much sterilization each day of the apparatus used, as well as possession of the equipment itself.

Many efforts have been made to simplify the administration of the organic arsenic preparations. They have been enclosed in capsules by enterprising manufacturing chemists, in order that the dose might be swallowed or introduced into the rectum. Unfortunately the drug is too unstable for this method and appears to lose its efficacy as a curative agent when so administered. To obtain therapeutic effect it is necessary to introduce it directly into the circulation or meditately by intramuscular injection.

Persistent attempts have been made, by combining the drug with various local anæsthetics, to avoid the intense pain and disability which is caused by even the blandest of the new organic arsenic preparations when injected into muscle, or subcutaneous tissue. Susceptibility to pain varies so greatly that while some individuals do not appear to suffer much, the majority complain very bitterly of the pain caused by these injections, and it is not likely that this method will become at all popular among patients, a consideration which will probably have more weight in private practice than in the army.

The view sounds reasonable and it may yet be proved that owing to slower and more continuous absorption, the therapeutic effects of arsenic introduced into muscle tissue are greater than when introduced directly into the circulation, but in so far as therapeutic effect is indicated by the rapid involution of external syphilitic lesions and the reversal or inhibition of the Wassermann reaction, the intravenous method is equally effective.

The publication of a translation of Professor Thibierge's work on the treatment of syphilis (War Series) led us to adopt his method of administration of concentrated solutions in this clinic, where it has now been in use for three months, and we have

thought that a description of the technique used here and the results obtained would be of interest more particularly to the general practitioner, who requires simplicity of administration without loss of effect.

The apparatus required is to be found in the most modest surgery, for it consists of a hypodermic syringe and two or three small basins, although where a large number of injections have to be given several other articles may be used to increase speed and efficiency.

We have found that by the method about to be described, two officers and two orderlies give from fifty to seventy intravenous injections of arsenic and the same number of intramuscular injections of mercury in less than an hour.

After trial of a number of hypodermic syringes, the one we have found most useful, is a cheap two-piece glass syringe made by Maw of London. The points of special advantage being, a comparatively long barrel of moderate diameter so that, although graduated to 2 c.c., it will really hold nearly 4 c.c., while its narrow diameter enables the needle to be introduced at an acute angle to the skin. The plunger fits accurately and may be entirely withdrawn. There are no metal contractions at either top or bottom. The tapering connection for the needle has no shoulder and fits well so that there is no leaking, and while the needle, when in place, is firm, it can be easily removed. The needle is rather larger than the ordinary hypodermic needle and has a shorter point, so that while a vein is easily picked up there is less danger of a through and through penetration.

METHOD OF ADMINISTRATION

A 30 c.c. burette containing the sterile water is held upright by a stand and is continued at the bottom by a short piece of rubber tubing terminating in a glass nozzle and closed by a pinch cock. One of the orderlies flames the outside of an ampoule of the drug with a small alcohol lamp, files off the tapering end, runs in 2 c.c. of water from the burette and inserts a piece of small glass tubing with rubber connection at one end and a few filaments of wool at the construction near the centre, such as is supplied with the galyl ampoules. The ampoule is then gently shaken. Solution is complete in a few seconds. The ampoule is placed upright in a small board which has had sufficient half-inch holes drilled in it to hold the required number of ampoules.

The officer having picked a syringe out of a small basin of alcohol with dressing forceps, washes it in sterile saline solution, aspirates the contents of the ampoule by means of the rubber connection to the glass tube, picks out one of several needles which are boiling in a container beside him and adjusts it to the syringe. Meanwhile the other orderly has prepared the patient by fastening a light rubber tube round his upper arm and painting below the bend of the elbow with iodine. The patient seats himself at a narrow table on the opposite side to the officer, his arm resting on the table, the officer, steadying the skin with his left hand, introduces the needle into a vein, slightly withdraws the plunger to make certain that the needle is in the lumen of the vein, and, removing the tourniquet, completes the injection. The table should be so placed that the light falls freely on it, the needle puncture is so small that no bleeding takes place and no cotton or collodion is required to seal it.

The officer having completed the injection washes needle and syringe and returns the syringe to the alcohol and the needle to the boiling water. He picks out a second syringe and proceeds as before, using the syringes alternately.

It would be quite feasible of course for one medical man to do all this himself, only he would require several minutes to make each injection.

During the past three months two thousand eight hundred and fifty-nine intravenous injections have been given in the above manner in this clinic. There has not been a solitary case of thrombosis of the vein. There have been no early reactions of an anaphylactic character such as we used to have fairly frequently when injecting large quantities of distilled water, which was not above suspicion. There have been no reactions, late or early, which could be attributed to the method of administration. Owing to the small size of the needle the pain of introduction is less than where the larger needle required by the gravity apparatus is used and much smaller veins may be successfully entered. On three or four occasions the vein has been missed or completely penetrated and solution has been injected into the surrounding tissue. This accident causes a good deal of pain, swelling and disability, which, however, passes off in a few days without abscess formation or permanent indurations.

A microscopic examination of blood withdrawn from the vein into the syringe containing the arsenic solution shows the

blood cells apparently perfectly normal even some hours after withdrawal.

The drugs used by us have been Novarsenobillon and Novarsenobenzol, which have been supplied in ampoules containing 0.6 gm. and 0.9 gm. The smaller doses when required have been obtained by splitting one or more of these when dissolved between two patients.

We have used distilled water in making the solutions but only a very small quantity is required and it is pointed out by Thibierge that ordinary sterilized water free from gross impurities may be used in this small amount with impunity.

It has seemed to us that the administration of arsenic in concentrated solution is more effective than when it is given diluted, for our records for July, the first month in which all the patients being discharged had had a full course of treatment by the above method, show that one hundred and forty-one patients were discharged from hospital as out-patients during the month with their external lesions soundly healed, and that the average duration of their stay in hospital was sixteen days, a considerably shorter period than formerly. These patients return for treatment as out-patients at weekly intervals until their full course is completed.

The distribution of cases was as follows:

Cases with primary lesions only.....	71
Average stay in hospital.....	16 days
Discharged in less than 10 days.....	16 cases
Discharged in 10 to 20 days.....	32 cases
Discharged 20 to 30 days.....	18 cases
Discharged over 30 days.....	5 cases
Cases with secondary lesions.....	49
Average stay in hospital.....	14 days
Discharged in less than 10 days.....	13 cases
Discharged 10 to 20 days.....	24 cases
Discharged 20 to 30 days.....	6 cases
Discharged over 30 days.....	6 cases
Cases with recurrent lesions.....	13
Average stay in hospital.....	24 days
Discharged in less than 10 days	1 case
Discharged in 10 to 20 days.....	8 cases

THE CANADIAN MEDICAL

Discharged in 20 to 30 days.....	3 cases
Discharged in over 30 days.....	1 case

Cases with positive Wassermann reaction but without infective lesions on admission.....	8
Average stay in hospital.....	11 days

The records for August just compiled show that one hundred and sixty-six cases of syphilis were discharged as out-patients during the month, with an average stay in hospital of sixteen days.

They were distributed as follows:

Cases with primary lesions only.....	92
Average stay in hospital.....	16 days
Discharged in less than 10 days.....	32 cases
Discharged in 10 to 20 days.....	40 cases
Discharged in 20 to 30 days.....	12 cases
Discharged in over 30 days.....	8 cases

Cases with secondary lesions.....	31
Average stay in hospital.....	15 days
Discharged in less than 10 days.....	19 cases
Discharged in 10 to 20 days.....	8 cases
Discharged in 20 to 30 days.....	3 cases
Discharged in over 30 days.....	1 case

Cases with recurrent lesions.....	35
Average stay in hospital.....	17 days
Discharged in less than 10 days.....	19 cases
Discharged in 10 to 20 days.....	10 cases
Discharged 20 to 30 days.....	4 cases
Discharged in over 30 days.....	2 cases

Cases with positive Wassermann reaction but without infective lesions on admission.....	8 cases
Average stay in hospital.....	4 days

The total number of patients whose Wassermann test result has been received on completion of routine course is one hundred and thirty-eight cases, one hundred and twenty-seven of these are negative and eleven are positive.

Examination of the eleven cases with positive reactions on

completion of course shows that nine had generalized syphilis prior to coming under treatment at this clinic, while of the other two, one had had his primary chancre for five weeks without treatment before admission to hospital.

The Wassermann tests were made by No. 1 Canadian General Laboratory.

It has been shown that intravenous arsenic as ordinarily administered is eliminated pretty rapidly by the kidneys so that a large part of the dose is disposed of in this way within a few hours after administration. The diuretic effect of the distilled water and saline solution introduced into the circulation along with the arsenic may have something to do with this, and it is reasonable to suppose that when the dose is given in concentrated form it is less rapidly eliminated. We have not had the means to estimate quantitatively the arsenic in the urine and have been unable to verify this supposition.

When arsenic is administered by a gravity apparatus it is customary, in large clinics at any rate, to dissolve the doses for several patients at once, and as the solution is run out, more is continuously added during the period of an hour or longer according to the number of patients. It is clear that in this way some portion of the drug will be exposed to the air for a considerable time, as the tube is never allowed to entirely empty itself and some degree of oxidation is bound to occur.

Where solution is effected in the ampoule immediately after it is opened and the contents injected within a minute or less, oxidation prior to administration must be very slight indeed. In default of support from estimation of the rapidity of arsenic excretion it must be admitted that the number of cases is too few and the period of observation too short to establish the truth of the supposition that concentrated solution of arsenic is more effectual than dilute, but there is sufficient evidence to show that by their use syphilitic lesions undergo very rapid involution and that their administration in suitable dosage is perfectly safe.

VENEREAL DISEASES: THEIR TREATMENT AND CURE

OMAR WILSON, M.D.

Ottawa

THE present war is doubtless responsible for the upheaval of public opinion, the awakening of the public mind to the prevalence of venereal diseases in such alarming proportions. Certainly such awakening is responsible for the recent act passed by the Ontario Legislature for combatting venereal diseases.

For years we have watched with interest the abortive efforts made in various parts of the world to grapple with this problem, and to Ontario is due the credit of instituting a unique piece of legislation (not perfect by any means) which properly enforced, and loyally supported by the medical profession, promises results heretofore unobtainable.

The success of Ontario's Venereal Diseases Act is dependent upon various factors.

1. The rigid enforcement of the legislation now on the statute books, even to the extent of penalizing medical men who fail to fulfil its requirements.
2. The loyal and intelligent support of the profession.
3. An intelligent appreciation of the act by the laity.

The purpose of this paper is to emphasize the second requirement, particularly "the intelligent support of our profession", and to outline a definite course of treatment, which in the hands of the venereal practitioner will produce maximum results.

The Act explicitly states that a patient shall continue treatment until pronounced cured by a properly qualified medical practitioner. What proportion of medical men are properly qualified to pass on such cases?

Heretofore in our colleges venereal diseases have been shamefully neglected. In gonorrhœa our colleges, hospitals, and clinics have advised potass permanganate irrigations, the essential oils, the three-glass test, and such like until the discharge stops. With such hazy ideas students have been thrown upon the public with the

inevitable result, that husbands (in all good faith) have infected innocent wives, that there exists more gonorrhœa among married women than among prostitutes, and thirty per cent. of blindness in children is due to gonorrhœa.

The responsibility therefore lies at the door of the medical man who advised his patient that he was cured, when actually his condition had been rendered prostatic and chronic. It lies more directly at the door of our teaching institutions, who unquestionably are responsible for the appalling prevalence of venereal diseases throughout the land.

In my opinion, one hundred per cent. of cases of gonorrhœa are curable. The percentage of cures of cases of syphilis would necessarily be somewhat smaller.

A patient recently described prostatic massage as both unpleasant and undignified. Allowing this description to be correct, would we not as physicians more properly vindicate the dignity of our profession by making intelligent and scientific efforts to eliminate this great evil, than by continuing the somnolent ineffective efforts we are making to-day?

In stating that one hundred per cent. of gonorrhœal cases are curable, I do so advisedly. Such results, however, are only obtainable with men properly and scientifically trained.

No genito-urinary clinic can possibly do effective work without the co-operation of a fully equipped laboratory. No case of gonorrhœa should be pronounced such without the aid of the microscope—the day of clinically diagnosing any discharge as specific, has passed forever.

Many staining methods have been advanced, but perhaps the simplest and most efficient is either Wright's or Giemsa's. If unobtainable the ordinary methylene blue method will suffice.

The complement fixation test, while not applicable in acute or chronic catarrhal conditions, is yet of considerable value in generalized involvements such as gonorrhœal rheumatism.

Microscopic slides should be taken and reported upon daily, for in no other way can a proper knowledge of the progress of a case be obtained, and treatment should be based largely upon microscopic findings.

Although Neisser was the first to isolate the diplococcus, to Austria is attributable the accomplishment of the scientific and effective cure of gonorrhœa.

A prominent urologist has stated that prostatic massage alone will cure the great majority of cases. There is a smattering of

truth in his statement, for we all know that any case that has been untreated or improperly treated for a fortnight becomes prostatic. Assuredly prostatic massage with protargol irrigations will clear up one hundred per cent. of our cases, if they be otherwise uncomplicated.

As to protargol. Some years ago I was afforded the opportunity of experimenting with germicidal preparations in gonorrhœa. After prolonged experiments I became convinced that protargol gave best results, and curiously enough, that one half per cent. protargol was remarkably more efficient than solutions of greater strength. This doubtless is easily explainable. The silver preparations in catarrhal conditions have two distinct actions—a germicidal action and an astringent one. In solutions of strength greater than one half per cent. the astringent action predominates, closing up the follicles and so preventing the germicidal action to proceed particularly in the deeper tissues.

Technique. In the systematic treatment of a case of gonorrhœa the patient first removes his clothing. The clinician then glances generally over the integument for the prevalence of any rash. He next palpates the groin for adenopathy, examines the scrotum for testicular involvements—orchitis, epidymo-orchitis, varicocele, bubonocele, rupture or hydrocele. He now examines the penis. Patient retracts the prepuce which is examined for phimosis, paraphimosis, chancre, chancroid, and venereal warts. Some urethral discharge is now expressed and this is placed on a microscopic slide. The patient then urinates, after which physician examines the prostate and seminal vesicles. A second slide of the prostatic secretion is now obtained.

An old teacher of mine advocates prostatic massages and bladder irrigations of protargol even in non-prostatic cases, maintaining that the protargol is sufficiently germicidal to protect the bladder. I personally am inclined to look askance upon such measures, believing that it exposes the patient to unnecessary complication. Nevertheless, I must admit that throughout years of experience with this man I found no ill effects following this procedure.

In early anterior urethritis it is my practice to endeavour to abort the condition by daily anterior irrigations of protargol, either by patient or physician. With a rubber-tipped urethral syringe the patient is directed to inject protargol four times daily, holding the same in for a period of four minutes. If there be any burning with micturition due to hyperacidity he is given a mildly alkaline

diuretic to be taken per mouth. A large proportion of anterior cases can thus be aborted in ten days.

In prostatic cases the patient carries out treatment identically the same. Private ambulatory cases are required to report every three days for prostatic massage followed by bladder irrigations of one half per cent. protargol. In institution life where such cases are more readily controllable, such treatment can be given every two days, without danger of producing orchitis or other complication.

Such treatment, however, should be based upon microscopic findings with suitable alterations to meet the individual case.

It is quite unnecessary to discuss here the various complications other than prostatitis. Orchitis, epidymo-orchitis, seminal vesiculitis, gonorrhœal rheumatism, peri-urethral abscess, prostatic abscess and stricture, all demand special treatment, but a good working knowledge with remarkably good results can be obtained from the above mentioned technique.

Vaccines of course have their uses. In gonorrhœal rheumatism, they, preceded by a course of serum, yield excellent results. I have also found them invaluable in the mixed infections of chronic gonorrhœa.

Syphilis. As to syphilis little need be said. With the excellent facilities offered by our various provincial health Laboratories, one can and should obtain a reliable Bordet-Wassermann reaction on every syphilitic or suspectedly syphilitic case. The Wassermann reaction should likewise be repeatedly utilized, suitable treatment having been given, before a case should be pronounced cured.

As to anti-syphilides I should name among the arsenicals the following preparations in the order of their efficiency: salvarsan, kharsivan, diarsenol, ganyl, arsenobillon, the various "neo" modifications, "sub-salvs" (a rectal suppository of salvarsan).

Prophylaxis. And now, permit me a word with regard to prophylaxis. Two general methods are at present followed:

1. The establishment of preventive depots (at present for the military only) where patients may present themselves even within a period of from eight to ten hours following exposure, with excellent chances of arresting the disease.

2. Prophylactic packages containing urethral instillation of 20 per cent. protargol, and a jar of 30 per cent. calomel ointment; such contents to be used immediately before exposure.

The latter is undoubtedly the more effective method. Such packages have for years been issued to United States sailors and marines when applying for shore leave. The occurrence of venereal diseases has been thereby reduced to a fraction of one per cent. Similar experiments attempted both in Canada and in England have yielded equally favourable results.

With the clinical facilities at our disposal, with the intelligent co-operation of the profession, with the adoption of scientific methods of combatting these diseases, and the rigid enforcement of our new Ontario Venereal Diseases legislation, I believe that ten years will show a remarkable depreciation in the occurrence of these maladies, and twenty-five years will render them comparatively rare.

In conclusion might I suggest the establishment of a long felt want in the Canadian Medical Association, viz: a Section on Skin and Genito-Urinary Diseases. Such a Section would do much to arouse renewed interest in venereal diseases, and would prove an excellent educative factor as well.

THE medical departments of Harvard University, Columbia University and Johns Hopkins University, have been left a residuary estate estimated at between \$6,000,000 and \$10,000,000 by Captain Joseph Raphael de Lamar, capitalist and mine owner, who died December 1st. The object of the legacy is to provide funds for the study and teaching, or the origin and cause of disease, and its prevention. The study and teaching of dietetics is also demanded. Captain de Lamar told in detail his wishes with regard to the uses of the residuary funds. They are to establish fellowships, scholarships and professorships, and are to be used for the construction and maintenance of laboratories, clinics and dispensaries. The result of the study of dietetics and the effect of different foods and diet on the human system, are to be made the subjects of public lectures, and are to be published for the use of the general public not in scientific publications only, that the people at large may have the benefit of such research.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS

BY EUGÈNE GRENIER, M.D.

Montreal

WHENEVER anyone speaks to me of artificial pneumothorax the first question is invariably the same—*What results do you have?* I admit that question is interesting and practical. This is why, in February, 1916, at a meeting of the *Société Médicale de Montréal*, I endeavoured to satisfy the wishes of some physicians, by reviewing about eighteen hundred cases treated by artificial pneumothorax in Italy, Switzerland, Belgium, Denmark, France, United States, and Canada. Although at that time I had practised Forlanini's method for about two years, I did not include in this review any cases subjected by me to this treatment, because I had then realized that artificial pneumothorax is a delicate undertaking, its success depending on the skill of the operator. This decision I arrived at subsequent to making public in August, 1915, an analysis of the immediate results on nineteen cases. Now that I have made a couple of thousand insufflations, I prefer not to discuss them, but to treat of adhesions as an obstacle we meet frequently when inducing pneumothorax.

Pleural adhesions exist nearly always in pulmonary tuberculosis; when of recent age, they are, as a rule, elastic, when of long standing, usually difficult to distend. Before trying to induce pneumothorax, it is important to know of their existence and location. This is not easy. Knowing that the motions of the thorax are very restricted at the apices, we can assume that infiltrations developing there cause adhesions; the clinical forms of the disease, such as post pleuritic or fibroid tuberculosis leads us to the same conclusion; these deductions are made from our general knowledge and from the previous history of the patients, but the physical examination gives us many other details.

The inspection of the patient made in front, first, during

Read at the forty-eighth annual meeting of the Canadian Medical Association, June 13th, 1917.

a natural breath, second, during a forced breath, permits us to view flattenings, supra- or infra-clavicular, unilateral, or bilateral. If the patient is not in the last stages of the disease, these hollows are interpreted as being due to underlying adhesions. A retraction located at the base of the chest also suggests pleural adhesions; which is often accompanied at the same level by lagging. However, we must remember that active inflammation also causes a diminution of motion.

Profile inspection reveals sometimes during a deep breath a depression at the inferior spaces, suggesting pleural adhesions at the base of the lungs. In the back, inspection gives very few useful particulars. Many authors say that palpation assists us materially in locating adhesions. Muscular tissue overlying adhesions is of a doughy, lifeless consistency.

The vocal fremitus is also diminished, but this sign loses its value when the voice is impaired, and this fremitus varies in intensity with the thickness of the muscles and the adipose tissue; also, in women, it is naturally weak and sometimes absent.

Thin adhesions do not modify percussion sounds, but when they are thick the intensity is diminished and the tissues present pronounced resistance to the finger.

In auscultation, adhesions enfeeble the respiratory murmur; this diminution, associated with cogwheel respiration, indicates adhesions following pleurisy, but, if accompanied by rough respiration, it reveals, in addition, underlying fibroid lesions.

This paper would be incomplete if we neglected to consider x-ray findings. The fluoroscope shows us a well-pronounced shadow spreading to the diaphragm. Is this an adhesion? It is possible. Is it resistant? Perhaps. The radiographic plate reproduces the shadows, often superimposed. The stereoscopic plate brings out, in relief, the fine subdivisions of the bronchial tree visible through a cloud almost as far as the thorax. Have we adhesions at this level? Probably, replies the roentgenologist, and the clinician, after a close physical examination, gives the same opinion. Information secured from the above methods is often incomplete and sometimes incorrect, but the physician practising artificial pneumothorax seeks them because his intervention is freer outside of the adhesion zone, and the danger of gas embolism is avoided.

Figure 1 illustrates a right lung in course of compression. From the central black spot there appear stringy shadows in the form of a fan; these are elastic adhesions. Intervention here was relatively easy as we were fortunate in penetrating outside their

ASSOCIATION JOURNAL

POSTERIOR VIEW—RIGHT LUNG



FIG. 1—From the central black spot there appears stringy shadows in form of a fan; these are elastic adhesions.

POSTERIOR VIEW—RIGHT LUNG

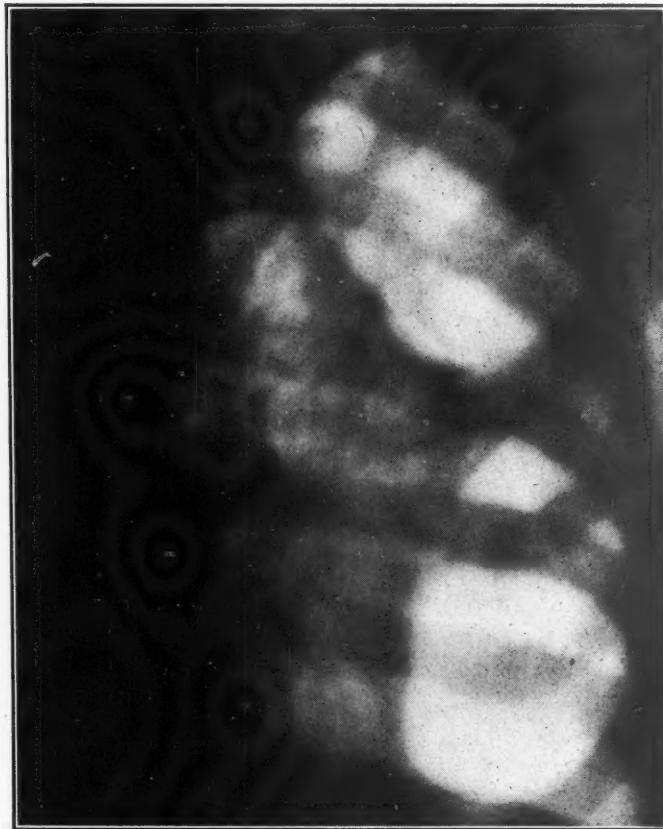


FIG. 2—In face of hard adhesions, we established two air chambers.

THE CANADIAN MEDICAL
POSTERIOR VIEW—RIGHT LUNG

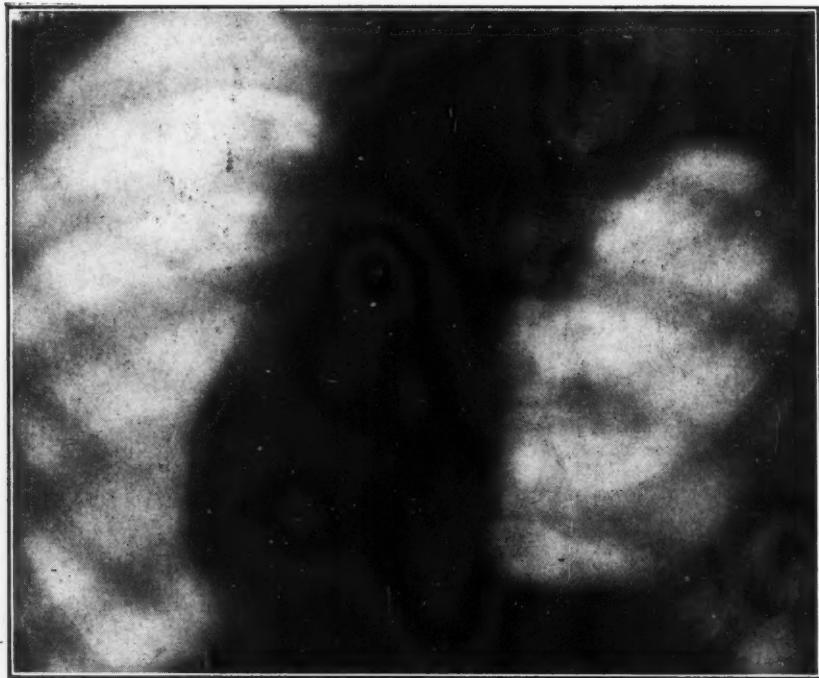


FIG. 3—Distended strings of adhesions extending from the diaphragm to the ribs.

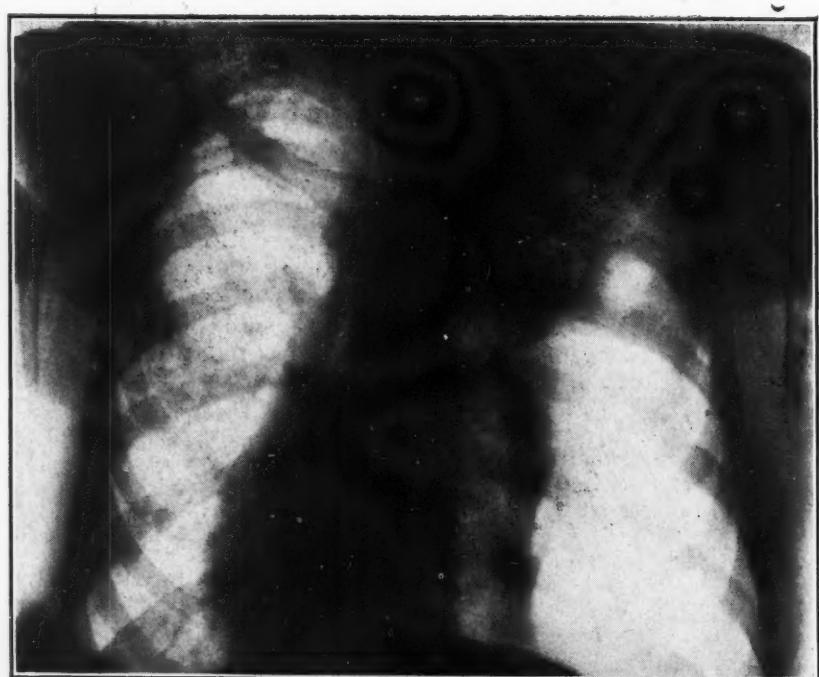


FIG. 4—Right lung in course of compression.

zone, but had we met with hard adhesions, our efforts would not have ceased there, for with perseverance we can succeed in establishing compression.

Figure 2 represents the right lung of another one of our patients—in the presence of hard adhesions, we were successful in establishing a small air chamber in the superior part of the thorax—several days later we did likewise at the base; the adhesions then gave way and when this radiograph was taken, the air chambers were communicating.

We proceeded in a similar manner in Figure 3, in which we see distended strings of adhesions extending from the diaphragm to the ribs. Here the pleura is thick and the puncture difficult to make. The diaphragm is high, and the oscillations of the manometer were hard to interpret.

Figure 4 shows us a right lung in course of compression,—we succeeded in avoiding adhesions when making each intervention.

In resumé:—Seek by all means to localize adhesions, if any exist; then, to avoid danger and pain to your patient, make your intervention outside of their zone. If this is impossible, do not abandon this mode of procedure without trying to establish several air chambers in an endeavour to overcome the resistance of adhesions.

IN a recent bulletin of the Canadian Army Medical Corps, Major Harold Orr is officially given credit for devising one of the most effective methods of killing trench lice. Major Orr, while captain and sanitary officer of the Shorncliffe area, conducted a series of experiments in infestation. Professor Nuttall, F.R.S., advised Major Orr to continue his experiments on a larger scale and authority was obtained to build a hut for this purpose. So successful has Major Orr's device proved that "Orr's Huts" are now to be employed throughout the British army overseas.

THE EYESIGHT OF THE NEGROES OF AFRICA

BY J. N. ROY, M.D.

*Physician to the Hôtel-Dieu, Montreal;
Late special delegate of the Canadian Government;
Laureate of the Academy of Medicine of France*

DURING a recent tour of study throughout the Dark Continent, where I visited twenty-two different colonies, I had the opportunity of examining the anatomical, physiological, and pathological condition of about five thousand negroes of one hundred different tribes; and it is the result of my researches on their eyesight that I intend to report in this paper.

After dealing with the question of refraction, vision during the day and night, and accommodation, I will briefly compare the eyes of the blacks with those of the other races of the earth.

In my work, I used the de Wecker's chart—built on the same principle as the Snellen's types—in which the smallest characters are normally perceived at the distance of five metres. My subjects being illiterate, I had to use the special chart made up of a certain number of squares of different dimensions, where one side left out represents the opening of each square. In this way my examinations were very simple and precise. Even the least intelligent could easily indicate with his hand the opening of the squares.

I used skiascopy for the refraction. Under the circumstances the difficulty of transporting the ophthalmometer would not have been repaid by the services obtained from it.

The African light is very bright, and the atmosphere very clear. Experiments led me to the conclusion that vision in the same person is better in Africa than in Europe. An emmetropic eye which, in the northern countries, has with good light a vision of 5-5 or even 6-5, can see in Africa one metre farther away, i.e., a vision of 7-5. This unity of 7-5 will, in this paper, be considered as the normal vision of a European in Africa or in the tropical countries.

A glance at the geography and ethnology of the Dark Continent shows that the different races came in contact according to

certain circumstances worth mentioning. The negroes of the Senegal Soudan intermarried with their neighbours of the north, the Berbers and the Arabs; and their offspring, the Moors, peopled chiefly Mauretania. Those of the north-east were gradually absorbed by the Egyptians who were always at war with the Ethiopians; and their union with the Fellahs gave origin to the race of the Peuhls and the Foulahs, who live in the neighbourhood of the Senegal river, the upper part of the Niger, and in the Fouta Djalon in French Guinea. The Arabs of Yemen made repeated incursions into Africa, crossed the coast of Somalis, and reached Harrar the capital of the country of Gallas in Abyssinia, where they remained in possession for a long time.

The negroes who came in contact with these different races inherited from them many diseases, chiefly syphilis and trachoma. I shall, at a later date, take the opportunity of dealing with this question of syphilis on that continent. Smallpox also made terrible ravages, chiefly where the means of communication are naturally easier than in the wild forest. The same may be said of purulent ophthalmia. In a general way the eyes of the people living north of the fifth degree of latitude north are not so good as those living south, on account of the lesions due to purulent ophthalmia, variola, trachoma, and the constant irritation of the sand.

Strabismus, due usually to corneal scars, or amblyopia from other sources, is also more frequent in the northern part.

I made a complete tour around the African continent, penetrating at many points even to a great depth. My conclusions are in a word that the people of the south were first infected by those of the north, who in turn had been contaminated by the Indo-Europeans.

It would be outside the sphere of this paper, even from the point of view of the union of races, and the resulting contagion, to deal at length with that continent which in the past probably bound Asia and the south of Africa, and of which the islands of the Soude are the vestiges. The Hottentots and the Bushmen with their Mongolian blood are a living proof of this hypothesis. The last descendants of these tribes, almost extinct nowadays, live grouped together chiefly on the frontier of Rhodesia, German South-West Africa, and the Portugese Angola.

Upon close examination of the eyes of the negroes, one is astonished at the considerable amount of pigment contained therein. At times it is even found on the ocular conjunctiva opposite the external canthus. The iris and the choroid are saturated with it,

and even in certain cases there is a physiological condition of melanosis of the soft palate and of the gums.

Refraction shows that their eyes are almost all emmetropic, provided there is no alteration of the cornea due to previous diseases. My statistics have given me the following results: Simple myopia is found in the proportion of about 1·5 per 100, and then it is always of a mild degree. I never had to use a glass higher than four diopters, and this was with albinos. In passing, it is worthy of note that this pigmentary anomaly is far more frequent in Africa than elsewhere. In Nigeria I saw a family of the tribe of Yorubas composed of five children, one dark, and four albinos. It would have been interesting to find out from the point of view of progeny, if the albinos intermarried; but, in spite of a most careful inquiry, it was impossible to establish that fact on account of the way they are treated in their own villages. At places they have no prestige; at others they are considered as unlucky; while sometimes they are sacrificed at birth, or regarded as fetish.

Myopic astigmatism is found in about the same proportion as simple myopia, *i.e.*, 1·5 per 100; and I never had to use a cylinder higher than -2·5 to correct the error.

There is an absence of keratoconus and keratoglobus in Africa.

Simple hypermetropia and hyperopic astigmatism are found in about 2·5 per 100. The highest degree of hypermetropia was corrected by a sphere of +3·5, and astigmatism by a +2·5 cylinder. I saw but few cases of compound astigmatism, and those chiefly among albinos. I never had a case of mixed or irregular astigmatism.

All these percentages are based on cases with absolutely transparent corneas. It goes without saying that alterations of the cornea due to diseases are met with in Africa as elsewhere. These percentages are based on an average of the whole continent. Where schools of instruction have long been established, they maybe too low; but at places where almost every one was emmetropic, they are certainly too high. Practically all cases of ametropia were corrected by very weak glasses.

In a general way, I have been surprised at the excellent eyesight of the negroes. In rare cases, I have even observed that a correction of two to three diopters of either hypermetropia or myopia could improve their vision up to 9-5 and even 11-5. The highest normal vision recorded was one of 20-5, and this was in a man affected with sleeping sickness. I shall, in a later paper, deal with this disease, and show the great resistance of the negroes' eyes to the human trypanosomiasis. My statistics show that the

average vision of the natives of Africa is 12-5. More than any other race have they the faculty of seeing to a great depth in water. In spite of the most careful researches, even in eyes suffering from diseases, I have never observed any alteration of the colour vision or hemianopsia.

It is with pleasure that I mention my gratitude to our confrères of all nationalities with whom I came in contact. Their organization of all kinds have been a great help to me in my researches.

The negroes have a great power of vision in the dark. I made a series of experiments to compare their sight at night with ours. The subjects, both Europeans and natives, were first refracted, and all ametropic or diseased cases were eliminated. To be understood by all, I had to proceed in the following simple manner. I made with white paper certain figures representing a square, a cross, or letters like L. I. V. T., etc. These figures were placed on a black-board. The group to be examined stood far from these objects, the Europeans on the right, and the natives on the left. A period of one minute was allotted at each distance. If at the end of that time none of the group could see, all moved forward one step, and so on. When any one could recognize the object, he was led aside and had to describe in some way the figure seen. If he was right, the distance at which he could see was measured; if not, he had to rejoin the group. In this way, I calculated the distances at which everyone could recognize the object. I repeated the test with the different figures. My experiments, repeated frequently and at different places, show that the negroes see at night from two to four times better than the whites. Admitting this fact, what is the explanation? A number of enucleations have given me the material for histological researches, chiefly on the retina. The comparative anatomy of the eye shows that it is in the rods of the retina one finds the difference between the diurnal and the nocturnal animals.* Schultze had expressed the opinion that the latter had no retinal cones. Later this was found to be erroneous, as most of the reptiles which are nocturnal, have more cones than rods. Up to now the only difference found is that the nocturnal animals have longer and thinner rods than the diurnals. I paid special attention to the examination of the retina. Unhappily the histologists I consulted found nothing new

* J. N. Roy—"Anatomie et physiologie comparées de l'œil et de ses annexes."
—*Archives d'Ophthalmologie de Paris*, Juillet-Août, 1912.

on the subject. There was a larger amount of pigment in the eyes of the negroes than in those of the whites; but the rods in both races have the same form. We are forced to believe that their excellent vision in the dark is due to their greater use of their eyes at night compared to us. I have noticed the same thing with the Indo-Chinese, the Malays, and Redskins, whose vision at night is very good; and even among the Hindoos, whose origin is Aryan.

I paid particular attention to their power of accommodation. It was easy to have positive facts on account of the presence, at different places, of scholars who could read fairly well. My researches on the subject show that the natives of the Dark Continent have a better power of accommodation than the whites, according to the standard given by the figures of Donders which I will discuss later on. A study of a series of fifty observations from my statistics shows without doubt the existence of this superiority, and, besides, corroborates all our previous statements. These observations are practically alike, and were all made on emmetropic cases. To get the *punctum proximum* I used the smallest characters of the de Wecker's chart. The optometer with thread would have given results hard to control.

Observation	Sex	Tribe	Age	Amplitude of Accommodation	Emmetropic Vision
1	man	Ouolofs	16 years	0.07 cent. = 14.28	14-5
2	"	"	18 "	0.082 " = 12.19	12-5
3	"	Bambara	17 "	0.08 " = 12.5	13-5
4	"	Mandigue	29 "	0.107 " = 9.34	12-5
5	"	"	15 "	0.068 " = 14.7	10-5
6	"	Bambara	20 "	0.085 " = 11.76	15-5
7	"	Malinke	22 "	0.088 " = 11.36	12-5
8	"	Soussous	24 "	0.09 " = 11.11	12-5
9	"	"	30 "	0.103 " = 9.7	11-5
10	"	"	23 "	0.09 " = 11.11	12-5
11	woman	Fantis	14 "	0.067 " = 14.92	16-5
12	"	Apollonienne	14 "	0.07 " = 14.28	12-5
13	"	Fantis	13 "	0.065 " = 15.38	15-5
14	"	Accra	15 "	0.072 " = 13.88	11-5
15	"	Achantis	22 "	0.084 " = 11.9	9-5
16	"	"	18 "	0.077 " = 12.98	14-5
17	"	Yorouba	29 "	0.106 " = 9.43	11-5
18	"	Ibos	20 "	0.088 " = 11.36	14-5
19	"	Egbas	22 "	0.08 " = 12.5	15-5
20	"	Yorouba	25 "	0.102 " = 9.8	10-5
21	man	Minas	23 "	0.085 " = 11.76	14-5
22	"	"	23 "	0.08 " = 12.5	17-5
23	"	Evhe	25 "	0.087 " = 11.49	18-5
24	"	Dagomba	19 "	0.07 " = 14.28	11-5
25	"	Fons	19 "	0.075 " = 13.33	10-5
26	"	Bassa	23 "	0.073 " = 13.69	14-5

Observation	Sex	Tribe	Age	Amplitude of Accommodation	Emmetropic Vision
27	man	Malumba	21 years	0.07 cent. = 14.28	15-5
28	"	Kumba	24 "	0.082 " = 12.19	13-5
29	"	Malumba	21 "	0.074 " = 13.51	10-5
30	"	Bassa	18 "	0.07 " = 14.28	12-5
31	"	Loango	16 "	0.07 " = 14.28	10-5
32	"	Yacoma	13 "	0.067 " = 14.92	13-5
33	"	Batetela	16 "	0.065 " = 15.38	10-5
34	"	Azande	15 "	0.075 " = 13.33	12-5
35	"	Bangala	16 "	0.075 " = 13.33	11-5
36	"	Yacoma	15 "	0.07 " = 14.28	15-5
37	"	Basonge	14 "	0.065 " = 15.38	11-5
38	"	Bangala	14 "	0.068 " = 14.7	12-5
39	"	Bakumu	15 "	0.075 " = 13.33	10-5
40	"	Basoko	14 "	0.062 " = 16.12	12-5
41	woman	Baluba	14 "	0.068 " = 14.7	12-5
42	"	Mongo	18 "	0.074 " = 13.51	11-5
43	"	Yacoma	17 "	0.07 " = 14.28	15-5
44	"	Basoko	15 "	0.066 " = 15.15	17-5
45	"	"	20 "	0.08 " = 12.5	10-5
46	"	Bangala	14 "	0.06 " = 16.16	13-5
47	"	Bapoto	16 "	0.065 " = 15.38	12-5
48	"	Mongo	16 "	0.068 " = 14.7	14-5
49	"	Basoko	19 "	0.07 " = 14.28	11-5
50	"	Loango	15 "	0.063 " = 15.87	10-5

If we compare these figures with those of Donders' chart, we see to what point the amplitude of accommodation in the negroes is superior to that of the whites, although I must say that the difference is not so marked as it looks. I regret very much I had to limit my researches to the period of life between thirteen and thirty years. Younger than that, my subjects could not read sufficiently to give definite answers, and after I could not trust their age. The negroes cannot give exact answers about their birthday. At times they will mention a certain number of years before or after a definite event in the history of their country, and from this event, as well as we know it, we have to deduce their age. I regret it so much more as it would have been interesting to know when presbyopia develops among them. However, our limited statistics, with subjects whose age was well known, show that it develops a little later than in the whites. It is but logical on account of their excellent power of accommodation, and the rarity of latent hypermetropia. This fact is worth mentioning because, according to some authors, among whom are H. Campbell Hight of Singapore, and J. Santos Fernandez* of Cuba, who have made

* J. SANTOS FERNANDEZ.—"Influencia del clima de la Isla de Cuba en las enfermedades de los ojos"—*Cronica Medico-Quirurgica de la Habana*, September, 1893.

"La presbiopia en la Isla de Cuba"—*Cronica Medico-Quirurgica de la Habana*, Mayo, 1898.

some experiments in their own country, presbyopia would appear from five to six years sooner in the tropics than elsewhere, and this not only among the Europeans who have been residents for a certain time, but also among the natives. According to them, the high temperature causing a general depression of the organism, and indirectly a diminution of the power of accommodation, would explain this phenomena; besides the way of living and the feeding of these different people could also have something to do with this condition. It is not so with the negroes. Moreover, I must say that the population of Singapore is composed of many nations in which the yellow element represented by the Chinese, the Japanese, and the Malays predominates. In Cuba there are Spaniards, Creoles, Chinese, Americans; and the other residents have lost, either as a result of their prolonged stay, or through intermarriage, a part of the characteristics of their own race. These anaemic white or yellow peoples, often affected by malaria, or born from diseased parents, are from every point of view far less resistant than the blacks, whose organism by heredity is used to the life in the tropics.

In Africa I was surprised at the excellent power of accommodation compared to the figures of Donders, and upon my return to Canada, I thought it would be interesting to make a control test of these figures. From schools of both sexes, and from my private and hospital practice, I examined a great number of persons of different origin whose ages varied from ten to sixty years. My results lead me to say that the amplitude of accommodation among the whites is greater than the Donders' chart would show. In these experiments the de Wecker's chart was used and the patients were asked to read, with one eye at a time, the smallest characters at the shortest distance. My conclusions are as follows. From ten to fifteen and from fifty to sixty years, my figures correspond to those of Donders; from fifteen to twenty there is an increase in the amplitude of accommodation of one diopter; from twenty to thirty, of two diopters; from thirty to forty, of three diopters; from forty to forty-five, of two diopters and from forty-five to fifty, of one diopter. Emmetropic cases only were examined, as the myopes and the hypermetropes would have given results either higher or lower than the Donders' chart which represents only the physiological accommodation.

If we examine, in a general way, the vision among the different races of the globe, we see that it varies greatly in individuals of the same origin. To avoid repetitions, and especially to remain on purely scientific grounds, I shall divide, as I did in a paper on Ozoena,

delivered before the French Congress of Oto-Rhino-Laryngology, in May, 1914,* the different peoples of the earth, from an ethnological standpoint, into three large families: the white, the black, and the yellow. Indeed, if we consider carefully the characteristics of the Malays and the Redskins, we find that the representatives of those two races have had the Mongolians for ancestors. The colour of their skin, the shape of their eyelids, the development of their malar bones, the flattening of the base of their nose, the thickness of their hair, and generally speaking, their facial expression, are all arguments in favour of this theory. Moreover, we find in the language of certain Indian tribes of South America, a number of expressions very similar to some Japanese words; and in Mexico, ruins of temples have been found with symbols which are undoubtedly vestiges of those who adorned the shrine of Buddha.

It is not my intention to speak at length of the vision of the whites, it is too well known for that; I will simply point out the most interesting facts not yet mentioned, and the results of my observations when their blood is mixed with that of negroes or of Mongols.

It is admitted that in Europe the errors of refraction depend on the races, and on the degree of instruction; and, as an example of that, we see that myopia is more frequent in Germany than elsewhere, while the Latins, and chiefly the Anglo-Saxons, in spite of their refined and advanced culture, are less predisposed to it. The same is noticed among the yellow peoples, not only of Asia but where ever else my many trips have permitted me to study it locally.

Myopia, quite frequent in Japan and China, is met with almost exclusively among the educated class; and, in spite of what certain authors say, it is not a national defect. Hypermetropia is met with a little more frequently.

The Malays, Philippinos, Hovas, Esquimaux, Laplanders, and the Redskins are like the negroes, almost all emmetropes; and Steiner† has the same opinion of the population of Java.

My statistics on the ametropia of the mulattoes and the half-breeds show that the vision in both has about the same characters. Seventy-five of the refracted cases among the mulattoes are astigmatic. In detail, the percentage is as follows: 50 per cent. of

* J. N. ROY.—“Ozœna among the various races of the earth.”—THE CANADIAN MEDICAL ASSOCIATION JOURNAL, September, 1917.

† L. STEINER.—“Coup d’œil sur 3104 cas de maladies des yeux chez les Malais”—*Geneeskundig Sydschrift voor Ned. Indie*, xxxvi., I.

hypermetropic astigmatism both simple and compound, 25 per cent. of myopic astigmatism simple and compound, 20 per cent. of hypermetropia, and 5 per cent. of myopia. Dr. Jones* of Newport News, Virginia, in a paper on the refraction of the half-breeds, comes to the same conclusion. His figures show 78 per cent. of astigmatics, of which 51 per cent. is of the simple or compound hypermetropic type, and 27 per cent. of the simple or compound myopic one. There is 19 per cent. of hypermetropia and 3 per cent of myopia. The word Indians in this paper means half-breeds only. It does not include the Redskins, for nowadays these are seldom met with in their pure condition. To study them carefully, one has to go, as I did, to Mexico or to Central or South America.

No irregular or mixed astigmatism was found among the mulattoes or the half-breeds, and all the corrections were of a slight degree.

Some authors have put forth the opinion that the depth of the orbit might have some influence on the development of the eye in its antero-posterior diameter and, consequently, upon the refraction. To deep orbits would correspond myopia, and to shallow ones, hypermetropia. Moreover, they think that the orbital diameter is in relation with the shape of the head, and that the more dolichocephalic is the cranium, the deeper is the orbit, and vice-versa. We know that in a general way, the yellow peoples are more or less brachycephalic, the whites mesoticephalic, and the negroes almost all dolichocephalic. My prolonged studies among the main races of the earth have shown me the falsity of this theory. Outside of the anomalies of refraction, due to abnormal curvature of the lens, or to previously existing diseases, which, by softening the posterior segment of the eye, alter its antero-posterior diameter, there is no rule to explain the causes of ametropia other than direct heredity. These hereditarily weak eyes succumb to the effect of fatigue brought on by delicate work, corneal lesions, defective light, and the constant use of poor printing. Moreover, according to Broca's measurements of the orbit, the Dutch with their shallow cavities are frequently myopes, while the Esquimaux with their large orbits are almost all emmetropics.

The vision of the different peoples is also proportionate to their intellectual development. Taking the white race as a point

* C. P. JONES.—“A study of one hundred refraction cases in Indians fresh from the plains”—*The Journal of the American Medical Association*, July 25th, 1908.

of comparison, we see that the eyesight of the Chinese and the Japanese is similar to ours; and of all the different branches of the yellow race it is the worst. The Esquimaux and the Laplanders, living in the northern countries, are next in the scale with a vision superior to that of their ancestors. The Philippinos, Hovas, Malays, and the Redskins have still better sight.

Warm climate seems to have a certain influence on the development of the ocular pigment. In individuals of the same race, born in different places, more pigment is met with in the tropics than in the cold countries. As a result of this there is a larger absorption of light rays, and an improvement of the sight, although I must say that the intensity of the light plays a great part.

Studying the moral and the physical condition of the mulattoes and the half-breeds, we find that they inherited from the whites all their defects and even their pathological atavism. When the good qualities exist—which is exceptional—they are always poorly developed. Their eyes are not so good as those of the Redskins and the negroes, but may be compared to ours.

The power of accommodation of the yellow race is as in the whites, superior to the figures of Donders. My statistics show it about equal in both races. The same may be said of the mulattoes and the half-breeds.

In concluding, let me once more call to your attention the marvellous visual apparatus of the negroes, as compared with that of the other peoples who live in a more or less primitive state, or who have reached the highest degree of civilization. After careful researches, I came to the conclusion that the higher the human being rises in the social scale, the more his brain develops at the expense of the organs of sense, chiefly of vision and of hearing, both of which can be estimated mathematically.

For the whites, their mode of life has a deleterious influence on their physique. The hygiene of the sight and hearing is defective on account of the use of strong artificial light and injurious noises. Diathesis is transmitted from generation to generation. In general, feeding is too heavy and too rich. Excesses of all kinds ruin the organism, and the needs of instruction require prolonged and tiresome studies.

None of these are found among the natives of Africa. They live the simplest life required by the most urgent needs of nature, and they have no ambition. Of all human beings, the blacks are without doubt the ones representing the lowest step of civilization.

Their eyes and ears are developed to the highest possible degree of physiological function. Next in the scale are the yellow peoples of the Islands of Oceania, then those of Indo-China, the Redskins of Mexico, of Central and South America, the Laplanders, the Esquimaux, and lastly, the Chinese and the Japanese. The whites are the last in the scale with a poor vision, compared to the other races, and even among them, it is influenced, as I have said previously, by the degree of instruction and heredity.

The ocular pigment seems to have a definite influence in the perception of the objects, and I believe that in the negroes, it is one of the main agents of their excellent vision. It absorbs some rays of light and neutralizes the ones that are irregularly reflected on the retina.

With the civilization brought to them by the Europeans, who now control almost the whole of Africa; with their mode of living changed chiefly in the increased absorption of a more or less adulterated food and of alcoholic beverages—which nowadays they even make themselves—with the advance of instruction in schools and workshops; with at places the use of artificial light, it is a question how long these natives will keep up their visual power, at present so perfect.

To the great regret of the medical profession and of the public, it has been decided not to publish at present and as a separate work, the history of the medical aspect of the Halifax disaster, completed by Professor Fraser Harris early last summer. It is understood that it will be incorporated in a report to be drawn up by the Relief Commission at the conclusion of their labours. This report may not be ready for a year or more from the present date.

CLINICAL NOTES ON THE INFLUENZA EPIDEMIC OCCURRING IN THE QUEBEC GARRISON

By E. A. ROBERTSON, M.D., *Captain C.A.M.C.*
Ottawa

SPANISH influenza was brought to Quebec in September by a party of American sailors recruited from many different parts of the United States. They were chiefly whites, but there were negroes and creoles among them. Although this party, which numbered six hundred, was promptly quarantined, sufficient contact was made with soldiers in the same building to introduce the disease into the garrison, and with marvellous rapidity it developed among the soldiers and the civilian population.

As medical officer in charge of medical wards of the military hospital and the soldiers wards of the Jeffrey Hale Hospital, a great many cases came under my care, and although, under the stress of additional work caused by the sickness of many of the staff, I was unable to give as much time as would have been desirable to the clinical study of individual cases, I wish to describe as best I may the disease as it appeared in Quebec.

The usual types of influenza were noticed, viz: (1) The mild type with chilliness, fever, general aching of head, back, and limbs, coryza and conjunctivitis, slight sore throat and prostration.

In these cases high temperature of a variable type running to 103° or 104° lasted from three or four days to a week and fell by lysis and there were no complications.

2. The severe type with pulmonary complications causing a rather high mortality.

3. The gastro-intestinal form, with nausea, vomiting, and diarrhoea as initial symptoms. These cases were few and were almost always associated with pulmonary symptoms of great severity.

4. The phthisical type. I noticed two cases, possibly, of this kind and it is yet too soon to be sure that they are not cases of ordinary tuberculosis of the lungs.

Of these four classes I may dismiss the first form with a few words. The symptoms differed but little from mild endemic influenza. Albuminuria, however, was noted in about 15 per cent. and epistaxis was not uncommon.

The second class deserves more attention. Most of these cases had been sick for several days or a week before entering hospital and were in a critical condition with pulmonary complications already present. Some others had only been sick a day or two and gradually developed bronchitis and bronchopneumonia. Very few showed any abrupt onset as would occur in lobar pneumonia. A moderate percentage after several days of high temperature with but little cough suddenly developed a pleurisy which rapidly spread to the underlying lung and ran the ordinary course of a broncho-pneumonia.

While of course each severe case differed in detail from every other I will attempt to describe a typical example:

When first seen the patient was drowsy and stupid, hard to rouse, irritable and with a depressed expression. The face was flushed, the nostrils were blocked, and breathing was oral. The tongue was heavily coated with thick whitish fur at the edges, with a brown centre. The lips were dry and often covered with secretion or with herpes, and they were slightly blue. The throat was dark red and the mucous membrane covering the pillars of the fauces and pharynx swollen. The breath was of a peculiar feverish throaty odor. The voice was husky. The skin was hot but moist. No rash was visible but the capillary circulation was increased, as shown by a decided flush. The temperature was 103° or 104°, the pulse below 100 and the respirations 24. Physical examination of the lungs showed bronchial breathing general over both lungs. The urine contained albumin and quantities of bacteria. The predominating organism was one resembling at first glance the staphylococcus pyogenes aureus but which Captain H. Morell, the bacteriologist of the military hospital, considers as a diplococcus with close affinity to the diplococcus pneumoniae. The sputum was greenish yellow or stained with dark blood, thick and tenacious. It contained the same organism. The subjective symptoms were extreme weakness, severe headache and backache, aching of the limbs and pain in the abdominal muscles from coughing. As time went on coughing became more productive, quantities of blood stained expectoration or nearly pure dark blood were expelled, the respiration became rapid and laboured, the face and fingers cyanosed, active delirium came on,

the patient was with difficulty kept covered and often tried to get out of bed. Prostration became more marked, the tongue dry and brown, the whole surface of the body blue, the temperature rapidly fell and the patient died from failure of the respiration. The signs of a spreading broncho-pneumonia were usually evident early in the disease.

While this may serve as a description of a typical case, there were others which presented peculiarities of their own. I will now bring to your attention a few particular cases.

A. B. was admitted to the Jeffrey Hale Hospital with nausea and vomiting of blood, severe abdominal pain and diarrhoea. His temperature was 103° and pulse 96, respiration 28; he was restless and excited, but not delirious. He rapidly became profoundly toxic and died within twenty-four hours after getting out of bed and having a profuse bowel movement on the floor. Signs of broncho-pneumonia were found in the lungs. Another case was admitted to Jeffrey Hale Hospital with profuse epistaxis. He became extremely weak, his temperature fell below normal, and he died within twenty-four hours although his haemorrhage had been checked. I did not see this case myself, but I was given a description of it by another medical officer.

An American officer was admitted with many of the typical signs of typhoid fever. His spleen was enlarged and he had rose spots on his abdomen and chest. He rapidly developed broncho-pneumonia with bloody sputum and epistaxis and died after two weeks' illness. His urine and sputum were loaded with the organism previously mentioned. Several cases presented laryngeal symptoms, voice was lost, and blood stained sputum brought up, while all signs and symptoms of involvement of lungs were absent.

Of the fourth variety I have seen only two cases which looked like the chronic form of influenza. It is too early to make a positive diagnosis. One patient, however, gives the history of a severe attack of Spanish influenza a month before he entered hospital. He came in spitting freely and stated that he had first noted blood in his stools and had vomited blood. The blood during his stay in the hospital, however, clearly came from the lungs, though it was not arterial or frothy but thick and dark. Great quantities of this were brought up and his condition became very critical. His pulse was frequent and he was much prostrated, while his temperature was high and very variable. There was evidence of cavity formation in the lower lobe of the right lung and thick sputum of purulent character streaked with blood was brought up. The

temperature still rises at night, no tubercle bacilli have been found in the sputum after frequent examination, though the organism mentioned previously is very abundant. With the history of a recent attack of Spanish influenza and the absence of tubercle bacilli in the sputum, it appears at least possible that this is a case of pulmonary infarction with destruction of a portion of the lung tissue and not of tubercular origin.

The other case was that of an American negro who entered hospital with a lobar pneumonia involving the whole right lower lobe. No crisis took place and his temperature is still variable with an evening rise. At one period I suspected fluid in the chest and did an exploratory paracentesis, but found no fluid.

There is still blood in his sputum and signs of softening in the right lower lobe, his sputum does not contain tubercle bacilli, but does contain the same micro-organism as the other cases.

In view of the fact that this epidemic differs in many respects from previous ones, notably in the prevalence of haemorrhages from the various mucous membranes and in the very high mortality in those cases involving the lungs, it is fair to suspect that the Pfeiffer bacillus is not the only or even the main causative factor. It is probable that another micro-organism, perhaps not yet identified, is responsible for the present type of disease.

Before leaving this part of the subject I cannot refrain from drawing attention to the close resemblance between the severe cases and pneumonic plague as described in the text-books.

The frequency of haemorrhagic symptoms is very striking. Of course the mortality is less and the plague bacillus has not been demonstrated. Still we must admit that we are faced with a very severe infection, and it is possible that some hybrid form of bacterial infection of peculiar virulence has been developed by the passage of the infective agent through the white, black, and yellow races which have been brought together during the war.

With regard to treatment I have seen no effect from the many drugs administered and I must confess that the recoveries seem due to the *vis medicatrix naturæ* rather than to any remedial agency. Treatment by serum would seem most rational. The chief hope in prophylaxis seems to lie in the production of an efficient vaccine. I must say that I believe more harm than good has been done by gargling and spraying with various so-called antiseptic solutions.

It is well known that spraying the nose and throat of a healthy individual with watery solution of chemical antiseptic, however bland, will cause hyperæmia and irritation after a few days' use.

Such a condition produces a fine field of culture for any active bacterium, while the antiseptic action can be merely temporary and in the intervals the mucous membrane will be more vulnerable than before.

In conclusion I must express my regret that owing to press of work, night and day, while many medical officers were sick, I and my colleagues in the military hospital have been unable to work out this interesting problem in the scientific way it should be done.

MORTALITY from tuberculosis among the civilian population and in the armies of all the countries engaged during the four years of hostilities, has at least approximated the total number of soldiers killed in battle, according to Dr. Livingstone Farrand, director of the American Commission for the Prevention of Tuberculosis in France. He states that 50,000 of the men called to the colours in the country's first draft summons were found to be tubercular. He declares that this is one of the striking conditions of the prevalence of the disease in the United States.

Dr. Hattie, medical health officer for Nova Scotia, estimates that the economic loss from unnecessary deaths in Canada is \$150,000,000 per annum. Professor Irving Fraser, of Yale, estimates that the saving possible from better conditions of public health in the United States is far greater than \$1,500,000,000 and may be \$3,500,000,000. It is estimated on the highest authority, that in North America, 690,000 people are lost annually by deaths from preventable causes. These are appalling figures, even to-day, contrasted with the toll of life taken in Europe. Feeble-minded children cost America \$90,000,000, and crime costs \$600,000,000 a year. A great proportion of this loss could be saved if proper hygienic measures were taken by government authorities. Much of the loss is due to lack of intelligent development and to criminal indifference. The very sacrifices which have been made in the war demand that attention be paid to laying the foundation which will ensure healthy living conditions and increased efficiency in the future.

PLEURISY: EXPERIMENTAL AND CLINICAL

BY ROBERT C. PATERSON, M.D.

Saranac Lake, N.Y.

ALTHOUGH the diseases of the pleura are an old study, the importance of pleurisy is being more and more recognized as constituting in many cases one of the initial and earliest symptoms of tuberculous infection of the lungs. Soper, writing from a Base hospital in France, tells me that a large proportion of the chest cases are pleurisies, and Ameuille¹ of the French army, has made the same observation. The importance of the subject is therefore apparent, and any work which can give us new light and fresh information may not be out of place.

In an attempt to obtain serum from pleural effusions for some experimental work, I was surprised to find that no fluid was produced in the pleura of rabbits, after inoculating with tubercle bacilli a previously induced pneumothorax. On making a second inoculation several weeks later, fluid was produced rapidly and in abundance. These observations opened up the whole question of the causation of pleural effusions, a subject which had not previously been investigated except by Cleaveland Floyd², who found that purulent pleural effusions were caused in experimental animals by inoculating a previously sensitized pleura with virulent pyogenic organisms, but that without such previous sensitization, pus was not produced. I decided to do some experimental work to find out how the pleural reaction to a second infection differed from that to a first, and whether the altered reaction was a part of a general allergic condition of the body or was dependent on previous local infection. In 1890 Koch³ noticed that the skin of a guinea pig already tuberculous reacted to an inoculation of tubercle bacilli, quite differently from the skin of a normal animal. Since that time, this altered reaction of tuberculous animals to reinfection has been studied, but it is only recently that its importance in interpreting the manifestations of clinical tuberculosis has been recognized.

Experimental study. A number of guinea pigs were given a subcutaneous inoculation, in the right groin, of an emulsion of tubercle bacilli which have been cultivated for over twenty-five years and which, during cultivation, have lost most of their virulence for guinea pigs, and after subcutaneous inoculation cause a localized abscess, and reach the regional lymph nodes, but do not become generalized or cause death. Animals thus infected will react to tuberculin. I have called the animals treated in this way "vaccinated animals", and the infection the "vaccinating inoculation". Three weeks or more after this infection with bacilli of low virulence, these animals, and a like number of normal controls, were inoculated in the right pleural cavity with an emulsion of virulent human bacilli. The vaccinated animals, within a few hours after the virulent intrapleural inoculation became noticeably ill, their fur was rough, breathing was rapid, they did not eat, and they lost their natural liveliness. A certain number did not recover from this condition and died in from seven days to two weeks. Death was thought to result from toxæmia, the livers at autopsy showing considerable necrosis. That this condition was not due to the operation is shown by the fact that none of the control animals showed any ill effects whatever following the inoculation, and within a few minutes were apparently perfectly normal, and none of these controls died as a result of the operation itself. If the vaccinated animals survived the first few days, they regained their healthy appearance and lived for upwards of ten weeks, some surviving as long as one hundred and fifty days, and at autopsy showed a generalized chronic fibro-caseous tuberculosis. In contradistinction to this the controls became progressively weaker and died with a remarkable regularity, in from four to six weeks. These animals presented a picture of an acute miliary tuberculosis. These differences are shown in the table on page 162.

In order to study the pleural changes animals were killed in pairs, a vaccinated and a control, at different periods after the intrapleural inoculation, and the pleuræ of the two series compared. The pleural response to the inoculation in the vaccinated animals is rapid and marked. In one hour after inoculation there is found a hæmorrhagic exudate, greater in amount than the fluid injected. This increases from day to day and reaches its maximum by the eighth or tenth day after which it is rapidly absorbed. Sometimes the fluid is so great in amount as to cause definite dyspncea, and in each case in which it amounted to 10 c.c. or over, the surface of the lungs presented a wrinkled appearance from compression. In

TABLE I.

Comparative length of life after inoculation in vaccinated and control animals

VACCINATED			CONTROLS		
Pig No.	Length of life	Remarks	Pig No.	Length of life	Remarks
	<i>days</i>			<i>days</i>	
26	7	20 cc. fluid	6 C	25	No adhesions
27	7	20+cc. fluid	10 C	28	Adhesion at point of inoculation
28	10	10 cc. fluid	8 C	36	One adhesion, right lung
43	14	25 cc. fluid	13 C	30	Few pleural tubercles
49	27	Cause of death, acute pneumonia	14 C	36	Adhesion at point of inoculation
6	28	Pneumonia (?)	20 C	31	No adhesions
9	73	Tuberculous meningitis	38 C	31	Adhesion at point of inoculation
14	78	Generalized chronic tuberculosis	26 C	36	Pleura negative
13	82	Generalized chronic tuberculosis	39 C	39	Pleura negative
10	115	Generalized chronic tuberculosis	27 C	67	One adhesion, right pleura
18	133	Generalized chronic tuberculosis	43 C	32	Acute pneumonia
38	111	No adhesions in pleura	44 C	36	No adhesions
39	123	Generalized chronic tuberculosis	45 C	36	Acute pneumonia
50	94	Generalized chronic tuberculosis, many adhesions	28 C	92	Chronic tuberculosis, few fine adhesions
40	141	Still living			
44	141	Still living	40 C	79	No adhesions
45	141	Still living			

nearly every case the opposite pleura from the one in which the inoculation was made, showed similar changes to those found in the side into which the bacilli were injected. This is undoubtedly due to a direct infection through the mediastinum which is very thin in guinea pigs. The character of the fluid varies according to the amount of bacilli injected, large doses, 0.001 gram or over of dried bacilli, producing a haemorrhagic effusion while smaller doses cause only a serous or faintly blood-tinged or turbid effusion.

With the development of the effusion there is also a marked production of fibrin which is deposited on the pleural surfaces, both visceral and parietal, giving them a shaggy appearance. It is noteworthy that in every case in which fibrin was present a con-

TABLE II
Results of varying dosage

Pig No.	Vaccinated	Intrapleural	Dose	Killed	Fluid	Character
51	March 23, 1917	April 14, 1917	0.001	2	8 c.c.	Serous, considerable fibrin in both pleurae
52	March 23, 1917	April 14, 1917	0.0001	2	5 c.c.	Bloody in both pleurae, some fibrin
53	March 23, 1917	April 14, 1917	0.00001	2	Few drops	Serous, right pleura
54	March 23, 1917	April 14, 1917	0.000001	2	Few drops	Serous, right pleura
55	March 23, 1917	April 14, 1917	0.0000001	2	None	
56	March 23, 1917	April 14, 1917	0.001	4	15+c.c.	Very bloody, much fibrin, both pleurae
57	March 23, 1917	April 14, 1917	0.0001	4	12+c.c.	Serous, slightly bloody, some fibrin
58	March 23, 1917	April 14, 1917	0.00001	4	5 cc.	Slightly bloody, no fibrin
59	March 23, 1917	April 14, 1917	0.000001	4	None	No fibrin
60	March 23, 1917	April 14, 1917	0.0000001	4	None	No fibrin

siderable amount was found in the interlobar fissures of the lung. As the effusion is absorbed, the two pleural layers become adherent to one another by this fibrin so that the pleural space may be temporarily obliterated. Eventually much of this fibrin is absorbed leaving a smooth pleura, while some becomes organized into fibrous tissue and remains permanently as firm fibrous adhesions. In the control animals there is little or no immediate pleural reaction following inoculation. With excessive doses, 0.002 gram or over, there may be a small amount of effusion and fibrin, but it is invariably less than in the vaccinated animals and does not always occur, while with small doses there is no exudation and no adhesions unless the underlying lung has been injured by the needle during the inoculation, in which case a localized traumatic pleurisy develops with one or a few fine adhesions as an end result.

The study of the effusions showed several interesting facts. The cells were at first almost exclusively polymorphonuclear leucocytes, a finding that we usually associate with acute and pyogenic rather than with tuberculous infections. In a short time, usually by the second day, lymphocytes make their appearance, and the polymorphonuclears gradually disappear until the small round cell

is the predominating one. At the time of the appearance of the lymphocytes a large cell with rather faintly staining nucleus also appears. This cell is very actively phagocytic and in them may be seen bacilli, fragments of nuclei of other cells and broken down red blood cells. They are probably mesothelial cells from the pleural membrane. Although relatively enormous numbers of tubercle bacilli were inoculated into the pleura, it was found that these had almost entirely disappeared by the end of the first twenty-four hours, and could not be demonstrated either free in the fluid or phagocytized by the cells. This rapid disappearance of bacilli has been noted by Manwaring and Bronfenbrenner⁴ in a study of the lysis of tubercle bacilli when injected into the peritoneum of tuberculous guinea pigs. In spite of our inability to find the bacilli by most careful search and the usual staining methods, the effusions were found to be virulent, as long as they were present, for normal animals, and to cause well marked tuberculosis. This fact does not correspond to the findings of Rist, Rolland and Kindberg⁵, who experimented with peritoneal exudates and who state that the inoculation of the "allergic exudate" failed to produce tuberculosis in seven out of twelve guinea pigs. Our results, as shown in Table III, were quite definite and prove, moreover, that the virulence of the bacilli is not lowered by the action of the serum.

TABLE III.
Virulence of effusions

Pig No.	Fluid from Pig	Days after Re inoculation	Inoculation	Method	Killed	Autopsy
21 Test*	21	1	Nov. 14, 1916	Subcutaneous	Dec. 27, 1916	Right inguinal gland caseous: deep iliac glands +, spleen tuberculous: acid-fast tubercle bacilli in pus
21 Test	21	1	Nov. 14, 1916	Intraperitoneal	Dec. 27, 1916	Tuberculous inguinal glands
22 Test	22	3	Nov. 16, 1916	Subcutaneous	Dec. 28, 1916	Inguinal glands caseous: acid-fast tubercle bacilli in pus

Pig No.	Fluid from Pig	Days after Re inoculation	Inoculation	Method	Killed	Autopsy
22 Test	22	3	Nov. 16, 1916	Intraperitoneal	Dec. 28, 1916	Spleen tuberculous
23 Test	23	5	Nov. 18, 1916	Subcutaneous	Jan. 10, 1917	Inguinal glands caseous: spleen, two small nodules
23 Test	23	5	Nov. 18, 1916	Intraperitoneal	Jan. 10, 1917	Spleen slightly tuberculous
24 Test	24	7	Nov. 20, 1916	Subcutaneous	Jan. 10, 1917	Caseous abscess, right groin: spleen tuberculous: few foci in lungs
24 Test	24	7	Nov. 20, 1916	Intraperitoneal	Jan. 10, 1917	Spleen slightly tuberculous: few foci in lungs
25 Test	25	9	Nov. 22, 1916	Subcutaneous	Jan. 10, 1917	Inguinal glands +: spleen, one nodule
25 Test	25	9	Nov. 22, 1916	Intraperitoneal	Jan. 10, 1917	Spleen tuberculous: liver probably tuberculous
29 Test	29	11	Dec. 5, 1916	Subcutaneous	Jan. 19, 1917	Generalized tuberculosis (killed with one c.c. old tuberculin, injected intraperitoneally)
29 Test	29	11	Dec. 5, 1916	Intraperitoneal	Jan. 19, 1917	Generalized tuberculosis: serous effusion in both pleurae
36 Test	36	11	Dec. 6, 1916	Subcutaneous	Jan. 22, 1917	Generalized tuberculosis
36C Test	36C	11	Dec. 6, 1916	Subcutaneous	Jan. 22, 1917	Generalized tuberculosis
30 Test	30	13	Dec. 7, 1916	Subcutaneous	Jan. 12, 1917	Generalized tuberculosis
30C Test	30C	13	Dec. 7, 1916	Subcutaneous	Jan. 22, 1917	Generalized tuberculosis

* Test after number means that the test fluid was obtained from the pig of the corresponding number.

In one or two of the test pigs the localized nature of the disease produced by the effusion suggested that the virulence of the bacilli

had been lowered, but on making cultures from the glands of these animals and then inoculating fresh pigs the bacilli were found to be just as virulent as those of our original cultures. The question as to what becomes of the bacilli after injection has not been altogether settled. Some are taken up by the pleural lymphatics and carried to neighbouring glands, some are phagocytized, and some are enmeshed and held in the fibrin and thus deposited on the pleural surfaces and in the interlobar sulci. Do any remain free in the serum, and if so, what form? Our results would seem to show that some do remain free in the serum, although we were unable to find them, but whether this was because they are too few in number to demonstrate or because they are concealed in flakes of fibrin or because there is a non-acid fast form of the bacillus, as is held by⁶ Much and his followers, which does not stain by ordinary methods, I am not yet in a position to state. This inability to find bacilli in tuberculous effusions which are none the less virulent and capable of causing tuberculosis in guinea pigs, corresponds to the common clinical experience that fluid from a pleurisy may be tuberculous, although no bacilli can be demonstrated microscopically.

I shall not attempt to discuss at great length the mechanism of this altered reaction to infection of the pleura of already tuberculous animals for this brings up the whole question of immunity in tuberculosis and we would soon be far afield from our original subject. Briefly, however, I believe that the difference in reaction in tuberculous and normal animals lies in an alteration of the fixed tissue cells, which has been spoken of as an "allergic" condition, rather than in any change in the serum or body fluids. This altered reactive power to reinfection has been found in all the tissues of the body which have been tested, lungs, peritoneum, liver and skin. That the serum of the effusion is not the active agent is proved by the fact that the effusion is the result of the reaction and this very production of effusion is the basic and essential difference in the response of the vaccinated and normal animals. It might be suggested that the effusion once produced acted on the bacilli in some way so that their virulence was immediately lowered and the subsequent course of the infection thus altered, so that we obtain, as has already been shown, a more chronic tuberculosis in those pigs which have responded with the development of an effusion. To decide the question as to whether the serum lowers the virulence, the fluid was withdrawn from some animals and added to an emulsion of virulent bacilli and the whole incubated for

forty-eight hours, the mixture then being injected into the pleuræ of normal guinea pigs. These pigs behaved exactly like those which were above described as controls and the bacilli disseminated rapidly setting up an acutely fatal tuberculosis. I also tried inoculating the pleura of normal pigs with a bacillus of known low virulence and with an emulsion of killed virulent bacilli. The result of these experiments did not correspond to that following the inoculation of virulent bacilli into the pleuræ of tuberculous animals, but was similar to that which follows the introduction of any mild irritant into a pleura. As above stated, virulent bacilli were found in the pleural effusion by inoculation as long as any effusion was present. From these facts it seems to be a fair deduction that our results are not due to an alteration of the virulence of the bacilli or to the action of the serum on the bacilli, but must be explained by an alteration of the tissues themselves. In the vaccinated animals the response to the virulent intrapleural inoculation is in the nature of an acute inflammatory change and this inflammation tends to localize the bacilli. Some are phagocytized; some are enmeshed in fibrin and thus held; some are rapidly taken up by the lymphatics and carried to the regional lymph nodes while those which remain free in the pleura are diluted by the serum so that absorption would be more gradual. These considerations may account in part for the more chronic course of the general infection in the vaccinated animals, but it must be remembered that all the other tissues of the body, as well as the pleura, are in an allergic condition from the vaccinating inoculation so that the tissues in which the bacilli secondarily come to rest will also react differently from normal tissues and the further course of the infection thus be altered.

One interesting fact brought out by these experiments, as it were, a by-product, is this, that the mediastinal lymph nodes, with the tissues of the mediastinum, almost invariably showed an early infection with the bacilli, and the opposite pleura was very frequently diseased similarly to the one injected. This may explain the origin of infection in some of those clinical cases which are occasionally met with, in which tuberculosis is found in the substernal glands and abscesses from these present in the intercostal spaces near the sternum.

Summarizing the experimental work: intrapleural inoculations of tubercle bacilli in tuberculous animals result in an effusion and development of fibrin which does not occur in controls receiving a first infection intrapleurally; this acute pleural reaction tends to

localize the infection intrapleurally; these effusions can cause tuberculosis in other animals although no bacilli can be found; permanent fibrous adhesions are formed by the organization of the fibrin.*

While experimental work of this nature is interesting from a purely scientific point of view, it is doubly so if it helps us to understand our clinical cases, their symptoms and their rational treatment. From these experiments it seems fair to infer that effusions occurring in clinical cases of pleurisy are not due to a primary infection, but are caused by a pleural infection in a system already tuberculous. If the relatively enormous doses used in our experiments fail to elicit an effusion in normal animals, while very small doses do so in tuberculous animals it would be impossible to imagine the very minute infections, compared to the size of a human being, which are the only ones that we can conceive clinically, causing an effusion unless this infection should be implanted on an allergic pleura. A pleurisy with effusion must be looked on as a reinfection and not as a primary condition as it is usually considered. This secondary infection must reach the pleura from some focus already present in the body. It is impossible for it to be directly infected from without, except under most exceptional circumstances, as by trauma. I would offer the same suggestion as to the cause of the effusions which we so often see in our cases of artificial pneumothorax. In these patients the pleura is rendered allergic by the disease in the lungs for which the pneumothorax is induced. By the production of the pneumothorax the lung is compressed and the lymph flow altered from the normal by this compression, bacilli probably more readily gaining entrance into the pleura than they could under normal pleural relations and pressure, or else adhesions are torn as the lung contracts and bacilli are liberated from the torn surfaces. These bacilli infect the altered pleura and an effusion results, the character of the effusion, serous, turbid or frankly purulent, depending on the number of bacilli which enter the pleura. The rapid accumulation of fluid in a chest is a fact that we all recognize as a clinical truth. A man has a stitch in his side one day and the next we find his pleura filled with fluid. That this is not only possible but is a regular result of reinfection of the pleura is shown by our experimental animals. In these also we see the rapid disappearance of the fluid by absorption, a fact also well

* This experimental work has been described more fully in an article "The Pleural Reaction to Inoculation with Tubercl Bacilli in Vaccinated and Normal Guinea Pigs," which appeared in the *American Review of Tuberculosis*, vol. i, 6, August, 1917.

recognized clinically. If we thoroughly appreciate the fact that a pleurisy with effusion is not primary in itself, but is a reinfection from within, of a person already tuberculous, our conception of a rational treatment and prognosis will be altered. After all the symptoms of pleurisy have subsided with treatment, we will realize that the patient is still tuberculous and that the same or more serious consequences may again result unless the original disease, usually glandular or pulmonary, is thoroughly arrested and becomes so firmly encapsulated that further spread is unlikely. This result is to be obtained by regulating the patient's life for a sufficiently long period of time along the lines of the well recognized treatment for tuberculosis, and only when we realize that we are not treating pleurisy alone, but are treating a pleural condition in a tuberculous individual will the results of our treatment be adequate and permanent.

How is the effusion itself to be treated? Shall it be left alone or shall it be removed? These are questions of importance to us all, and even more important to our patients. The effusions in our experimental animals only occurred in those which showed a relative immunity to the disease and the production of an effusion must be looked on as one manifestation of immunity, however slight this immunity may be. The effusion of itself then is not a harmful thing, but probably is one of nature's helps in localizing the infection, for we have seen that in those pigs in which there was a local reaction to the infection and in which an effusion developed the disease assumed a much more chronic course than in those whose pleura showed no reaction. In some animals, to be sure, there was an over-reaction and the animals became dyspneic and were in danger of suffocation from the large amount of fluid in their chests. This is only another example of what is so often seen in pathology that the natural processes of healing may be so excessive as to be a source of danger. With this conception of an effusion as an immune manifestation which may be excessive, our line of treatment is indicated. It is not wise to immediately aspirate an effusion merely because we have discovered that it is present. Clinical experience has shown that many patients show a decided improvement after they have had a pleural effusion. Just how this benefit occurs we do not understand, but the fact itself remains. In some cases it is undoubtedly due to mechanical effects, the fluid serving to immobilize the lung, thus aiding healing of disease in this organ; but in others the effusion is too small to possibly have any such immobilizing or splinting effect and it is in these cases

that the resulting improvement is hard to explain or understand. On the other hand when an effusion is sufficiently large in amount to embarrass respiration, to displace the heart to such an extent that its action is interfered with, to force down the diaphragm and impair the function of the stomach, then relief, by removal of the fluid, is indicated and demanded. A general rule then might be given; aspirate large effusions which are producing symptoms by the amount of fluid, and leave alone small effusions which are not causing inconvenience. Between these two classes there are, however, a great many cases in which the effusion is comparatively large in amount, but producing no definite symptoms, and those where the effusion has been present for some time and shows little or no tendency to be absorbed. For these it is impossible to formulate definite rules and each case must be studied for itself. I would urge conservatism in the decision whether or not to aspirate, and ask you to remember that, as I said a moment ago, the development of an effusion represents one manifestation of an immune reaction. These remarks apply equally to the pure tuberculous empyemata which are occasionally found. If the infection is due solely to tubercle bacilli and not to a mixed infection, its removal should only be undertaken for some definite reason and if removal is decided on, aspiration and not thoracotomy, is the method of choice. If a portion of a rib is resected and a drainage tube inserted, secondary infection is almost invariable and such secondary infection is to be dreaded because of its known harmful results to the patient. These effusions, serous or purulent should, therefore, be left alone unless there is a definite indication for their removal, as when their presence is causing harm or endangering the patient's life. As regards the effusions which occur in about 40 per cent. to 50 per cent. of our artificial pneumothorax cases, we, at Saranac Lake, have come to the conclusion that they are best left alone unless very large in amount. These effusions are frequently found to be purulent, but often improvement begins only subsequent to their development. The question of operating or not on cases of natural pneumothorax in which pus has developed is often very difficult to decide. In these cases the pus is often due to pyogenic organisms and not to the tubercle bacillus, although we sometimes find pure tuberculous pus, even though the pleura is in direct communication with the respiratory tract through the tear in the lung. Personally I have never seen a case of spontaneous pyopneumothorax recover either with or without operation. The condition in any case is most pitiable. With operation the pleura

drains freely, dressings have to be frequently changed, the skin becomes excoriated from the discharge, the sound of air being sucked through the external opening, is most unpleasant and little or no improvement in general condition is seen to counterbalance all this misery. On the other hand, if left alone, with change of position, the pus may enter the lung through the tear, causing spasms of cough, septic absorption rapidly wears the patient down and aspiration of matter into the lungs causes rapid spread of disease. The last few cases of this kind that I have seen I have treated symptomatically, aspirating the fluid to relieve symptoms and this is possibly as helpful a treatment as any.

It must be remembered that aspiration or thoracentesis is an operation presenting possibilities of certain complications and demanding certain precautions in technique. Anæsthesia is of first importance, not only of the skin, but also of the deeper tissues down to and including the pleura. This is best produced by using a long hypodermic needle and infiltrating the tissues successively from skin to pleura. The danger of pleural reflex or pleural shock may in this way be eliminated. Much discomfort to the patient may be avoided if after anæsthetization the skin is incised with a fine sharp scalpel. This renders less force necessary in introducing the aspirating needle and also prevents the blocking of the needle with a punched out plug of skin. Frequently the fluid withdrawn is replaced with a slowly absorbable gas, as filtered air or nitrogen, which keeps up temporarily the pressure on the lung and allows the lung to re-expand slowly as the gas is absorbed, thus preventing the rapid expansion of the lung and rapid return of mediastinum, heart, and large vessels to their normal positions, which occurs after the aspiration of large amounts of fluid. This substitution of a gas for the fluid withdrawn will also largely prevent the rapid re-accumulation of the effusion which so frequently occurs after removal of large quantities of fluid from the pleura.

Let us now consider briefly the characteristics of the fluid found in tuberculous pleurisy. This is usually clear or slightly turbid, of straw colour, coagulates rapidly on standing and contains albumen and various cellular elements. While we are usually taught that the lymphocyte is the characteristic cell of tuberculous effusions and while this is usually found to be the predominating cell, the first response to an infection with tubercle bacilli is a pouring out of polymorphonuclears and in the more purulent effusions of tuberculous origin the polymorphonuclears may be the only cells found. One reason that we do not more often find polynuclear

cells in the effusions is that the period of the predominance of this cell has usually passed before the fluid is aspirated, for the fluid is seldom if ever obtained within the first twenty-four hours. Rist has recently made the statement that large numbers of eosinophiles are found in the early stages of artificial pneumothorax effusions, but I have not as yet been able to investigate this point. It also occasionally happens that the fluid contains a greater or lesser number of red blood corpuscles, although a frankly bloody effusion is more often associated with, and is very suggestive of, a malignant tumour of the lungs, mediastinum, or pleura. This cellular picture as seen clinically corresponds to that found in our experiments in which there was at first a polynucleosis followed later by a lymphocytosis and a disappearance of the polynuclears. In our effusions also there was a varying amount of blood, from a faint tinge to an almost pure haemorrhagic exudate. It is always difficult and requires prolonged and careful search to demonstrate tubercle bacilli in smears from even an unmistakeably tuberculous pleural exudate, but such exudates when inoculated into guinea pigs almost invariably produce tuberculosis, proving that the bacilli must have been present. Here again we find our experimental work corresponding exactly to clinical experience, as was mentioned earlier in this paper. At the same time as the serum is effused and in dry pleurisies without any effusion of serum, there is an exudation of fibrin from the pleural surfaces. This coats the pleura to a greater or less extent and with the absorption of the fluid causes an adhesion of visceral and parietal pleurae. Much and sometimes all of this may be absorbed, leaving the underlying pleura smooth and glistening, but some may become organized into fibrous tissue forming those firm fibrous adhesions which we see at autopsy and which cause so much difficulty in our attempts to induce artificial pneumothorax. These facts were corroborated in our experimental animals in which a perfectly smooth pleura was left after many fibrinous adhesions had been present. This capacity of the pleura to absorb fibrin was a great surprise to me, although it has been noted clinically in several recent cases in a striking manner.

I would like to add a few words about the diagnosis of pleurisy. While in well marked cases the diagnosis is easy, the pain, short, shallow respiration, the irritative cough and the friction rub being a combination of symptoms which are unmistakeable, yet there are other cases in which the friction is not marked and in which pain is the chief symptom. Intercostal neuralgia or pleurodynia, herpes zoster and vertebral caries probably cause the most difficulty

in diagnosis. It should be remembered that intercostal neuralgia is often only the external manifestation of a pleurisy somewhere along the course of the intercostal nerve, and that while the pain may be felt over the distribution of the anterior or lateral cutaneous branches, the pleurisy causing the irritation may be in the axilla or posteriorly. I find it very helpful, and always a safe precaution to take, to trace the course of any nerve giving symptoms of pain backwards to its origin in search of an explanation of this pain, if none is found locally. By doing this we may find the cause of pleurodynia to be a posterior pleurisy, or caries of the vertebra, corresponding to the nerve involved. It must also be remembered that the pain of a pleurisy may not be felt in the chest at all, but may be referred along the course of the lower intercostal nerves and be felt in the abdomen, and more than once the abdomen has been opened with negative findings and a pleural effusion or pneumonia discovered later on. This referred pain in pleurisy is comparable to the knee pain in hip-joint disease or to the sciatic pain in sacro-iliac disease. When a pleurisy is located near the apices of the lungs, complaint of pain in the shoulder and down the arm may be made, and is explained only by careful examination of the chest. Once an effusion has developed, the diagnosis is made on different signs. Pain largely disappears, but an uncomfortable, tight feeling may be present; as the pleural surfaces are separated by the fluid the friction disappears, the percussion note is dull or flat, breath sounds absent, vocal resonance and fremitus absent. Above the level of the fluid, the lung may be compressed and present certain abnormal signs. The thoracic organs may be displaced, all symptoms varying according to the amount of fluid present. At times these typical signs are not all present and we may get blowing breathing and whispering pectoriloquy over the fluid. This, of course, suggests some consolidation which has to be differentiated. The chief difficulty, however, in diagnosing fluid is to distinguish it from a thickened pleura or some solid growth of the lung itself.

Having made a diagnosis of pleurisy, either plastic or exudative, it still remains to determine the cause of the pleurisy. While pleurisy occurs in a number of infections and conditions, as with pneumonia, with typhoid, with tumours, with pyogenic infections, in heart disease, nephritis, and possibly with rheumatism, by far the most frequent cause is the tubercle bacillus. So frequently is this the aetiological factor that it is a safe rule to call every pleurisy tuberculous, unless there is other definite cause; that is, the burden of proof should be on the physician who says that a pleurisy is non-tuberculous.

If I were now asked what I consider the most important facts discussed in this paper, I would say: that a pleurisy is, in the majority of cases, tuberculous, and not only is it caused by the tubercle bacillus, but it occurs in a person already tuberculous; that treatment does not end with the disappearance of the symptoms of the pleurisy, but must then be directed to the primary tuberculosis; that the effusion is a manifestation of immunity and should not be removed without reason; that aspiration is an operation presenting certain definite dangers which, however, may be greatly lessened by careful technique.

BIBLIOGRAPHY

1. AMEUILLE—*Ann de med.*, 1917, i, 55.
2. FLOYD, C.—“*Tr. Am. Climat. Ass.*”, 1914, xxx, 205.
3. KOCH, R.—*Deutschse Med. Wchnschr.*, 1891, xvii, 101.
4. MANWARING and BRONFENBRENNER.—*J. Exp. Med.*, 1913, xviii, 601.
5. RIST, ROLLAND and KINDBERG—*Ann. de med.*, 1914, i, 312-375.

THE Hon. J. G. McKay, the first provincial minister to be put in charge of health affairs in any province in Canada, has come forward with the announcement of a hospital policy for Alberta of a most progressive nature. He advocates salaried resident doctors in all district hospitals; training schools for nurses, maintained jointly by the Provincial Government and the large cities; including the cities under the Municipal Hospital Act. He proposes that henceforth the provincial department will take the lead in organizing and advising hospital districts. In this he completely reverses the plan formerly adopted, which left everything to the initiative of the rural municipality. The Moose Jaw Board of Trade first fathered the idea of provincial hospitals at the Prince Albert Board of Trade convention some dozen years ago.

Editorial

WAR-TRAINED SPECIALISTS FOR THE BOARD OF PENSIONS

THERE has probably never been a four-year period in the history of medicine in which the activity of the profession has been carried on at higher pressure or with more concentration on certain branches of medical science than has been witnessed since 1914.

Exclusive of the treatment of the many types of wounds, marked advances have been made in the study of most of the ills to which flesh is heir, and there is no disease or injury of war but has produced its own specialist workers.

The advances in medicine thus made have yet to become common property. The State, therefore, cannot afford to lose the services of those to whose efforts they have been due. There is a field, the boundaries of which cannot yet be determined, for the employment of these men; for with the end of the war we have not come to the end of its injurious effects upon the participants.

In England, the Ministry of Pensions has publicly announced its intention of availing itself of the services of the war-trained specialists for the treatment of war invalids and the determination of their pensionability.

It is realized that though the civilian practitioner is capable of deciding upon a man's fitness for service, he is by no means as competent to be a judge of the soldier's condition on discharge. By virtue of first hand experience with war injuries, infections and diseases, those physicians who have shared in the hardships, vicissitudes, and exposures entailed by service in the field are undoubtedly best qualified to discharge satisfactorily the debt still owed to the disabled.

In the Canadian forces are many men eminently well-equipped by four years of strenuous study to complete this task. Some of these men have been returned from overseas and are already engaged in this work; others will become available as demobilization proceeds. The Canadian Pensions Board has from its inception availed itself to the fullest extent of the services of returned medical officers.

The expressed intention of the British Ministry of Pensions is already an established fact in Canada.

It has been announced by Dr. George E. Vincent, President of the Rockefeller Foundation, which has an endowment of \$100,000,000, that the organization, after diverting its activities for four years to war relief and army welfare work, in which it expended \$21,000,000, will immediately resume its work of attempting to rid the world of disease. The conquest of Yellow Fever and the Chinese Plague will largely enter the campaign. The peace programme adopted by the organization contemplates the expenditure of millions of dollars annually in attacking human ills in every part of the world.

Major-General William C. Gorgas, recently surgeon-general of the United States army, will soon head an expedition of scientists to Central and South America to examine the yellow fever conditions there. He will be accompanied by five noted experts and believes that by battling with the disease at its source in these countries it can be exterminated in a few years.

The plague in China and other Asiatic countries the organization will endeavour to exterminate. The medical school in Peking, erected by the Rockefeller Foundation at a cost of \$6,000,000, will be opened not later than October, 1920. Another medical school will be built at Shanghai.

LEADERS in the work of the eradication of tuberculosis in Great Britain, have been advocating the farm colony as

complementary to the work of the sanatoria. There are several such existing institutions, two of them being in Scotland. The colony might take from the sanatoria patients with the disease dormant, and who do not require nursing. The patient must be treated and trained so as to become capable of earning a livelihood under suitable conditions, with the risk of relapse reduced to a minimum. The work of the colony should be varied and interesting, supplying different grades of labour and sustaining interest. The colony should be within reasonable distance of a market and not contiguous to the sanatorium, with which it is worked in co-operation. The residences of the colonists need not be elaborate, and the buildings for the stock should be well designed and kept scrupulously clean. The risk of infection to stock and produce is negligible under strict medical supervision. The usual period of residence is one year. In one farm colony there was a pavilion for children, with a teacher in residence who taught them and supervised their work in gardening and forestry.

THE visit of Sir Arthur Pearson, the distinguished blind publisher and philanthropist, to this continent, has been of great interest and of much value to the important work of the re-adjustment and re-education of the invalided soldiers in this most difficult of all handicaps. Sir Arthur may be considered the founder of a new generation of blind men, who are not to be considered as blind, he is fond of saying, but as normal men without sight. His conception of a great training-school, in which the problems of bringing courage and means of self-support to the keen ambitious youths blinded in action in the present war, was formed late in 1914, and in March, 1915, St. Dunstan's College in London was opened by him, through the generosity of an American financier, Otto Khan, with sixteen inmates. Since then it has grown to include four London annexes and others at

Brighton, Hastings and Elkwyn. Ninety-four Canadians have undergone training at St. Dunstan's in the "Victory over Blindness", which is the motto of the place, and in massage, shorthand, telegraphy, poultry-raising, farming, and the other arts and the sports taught. Altogether some fifteen hundred British soldiers were blinded at the front. Six hundred and fifty-six of these have been through St. Dunstan's and the majority are earning more money now than they did before they became blind.

On his arrival Sir Arthur first visited Toronto and formally opened Pearson Hall, the Toronto Branch of St. Dunstan's, which has been named after himself. He then proceeded to Montreal and thence to Baltimore, where he discussed details of the work with the American authorities. The new American Hospital for the Blind is to be named the New St. Dunstan's in recognition of the splendid work done by the London institution. In his addresses, the courage shown by the blinded men in the first days of their affliction was particularly emphasized. "There's a period of dreadful hopelessness," he said, "the courage and resourcefulness of your Canadian boys have been beyond any tribute I can pay. It is the same courage that enabled them to carry Vimy Ridge, that enables them to meet the present situation, and accomplish miracles. And they are miraculous, for they accomplish in months what used to take years."

Obituary

DR. LIONEL BEECH

IN the death of Dr. Lionel Beech, British Columbia loses a man of distinguished career and one who was universally respected. He died at the Ganges Hospital, Victoria, on December 16th, after a short illness followed by an attack of paralysis. Dr. Beech was trained at the London Hospital, where he was twice elected House Surgeon. In 1873 he entered the Indian Medical Service, being first attached to the artillery, and then to the 38th Native Infantry, in Trichinopoly; from thence he was transferred to the 1st Light Infantry at Secunderabad. With this regiment he went through the Afghan War, 1879 and 1880, and received the War Medal. He was next appointed civil surgeon at Bellary during the Indian famine, and for the services rendered received the thanks of the Government. He also went to the Laccadive Islands on a leprosy commission, and remained there three months.

In 1893 Dr. Beech came to Manitoba, where he practised for eight years. He went finally to British Columbia, and settling on Salt Spring Island, in 1904, took up practice there. He leaves a wife, two daughters and five sons. All of the sons have been through the war, and two of them are medical officers in the Canadian Army Medical Corps.

DR. PHILIP HOWARD SPOHN

ONE of Ontario's oldest medical practitioners passed away recently in the person of the late Dr. Spohn, of Penetang. Graduating from the old Toronto School of Medicine forty-seven years ago, he entered immediately into practice at Penetang, where he remained in active service until eighteen months ago, when he removed to Toronto. During his life, Dr. Spohn was intimately associated with the public affairs of his town and county. He was the first reeve of Penetang, and in 1891 was elected a Liberal member in the Dominion parliament for the riding of East Simcoe. For twenty-five years he was surgeon in the old Reformatory for

boys, and was the first superintendent of the Hospital for the Insane, Penetang. He is survived by his wife and six children; one son is an officer in the Royal Army Medical Corps.

DR. WILLIAM THOMAS LITTLE

DR. WILLIAM THOMAS LITTLE, of Flesherton, passed away at the General and Marine Hospital in Owen Sound on November 2nd. He had been ill only two weeks and death was due to complications which followed an attack of Spanish Influenza. The late Dr. Little had been exceedingly overworked before his illness, and, like so many of the doctors who have died in the influenza epidemic, he literally gave up his life for his patients. He was in his thirty-fifth year. After his course at the Toronto Medical College, he was appointed house surgeon at the General and Marine Hospital. He subsequently went to practise at Flesherton, and in 1915, feeling the call for service overseas, he joined the R.A.M.C. with the rank of Captain. Arriving in England, he was sent immediately with the British army to Mesopotamia and saw active service there. After a severe illness, he was sent to Bombay, and later became a specialist in a large hospital in that city. Since his return to Canada in 1917, he had been practising in Flesherton where he won the love and respect of everyone. Dr. Little was married only last July, and universal sympathy is felt for Mrs. Little.

DR. J. W. ATKINSON

EVEN in these days of manifold calamity and the sympathy evoked thereby, the recent death of Dr. John Atkinson, the well known and popular physician of Mitchell seems particularly sad. Dr. Atkinson died during the recent epidemic after an illness of but two days. Although he had a bad cold, he worked continuously without thought of self, in the effort to stem the tide of the epidemic. As a result of this high pressure he was in no condition to successfully fight the disease. He was forty-seven years of age. He attended the London Medical School, and was a gold medallist, and house surgeon at Victoria College for a year. He practised for sixteen years in Mitchell.

DR. CLARENCE WILLIAM FIELD, one of Edmonton's best known and most prominent physicians, died on December 9th,

after a lengthy illness. He was under treatment with specialists in New York some time ago, but his ailment steadily increased and all hope of his recovery was abandoned. The deceased physician was born in Milton, Ontario. His medical and surgical training, as well as a special course in pharmacy, was taken at Toronto University. For the past few years he has been registrar of the medical association in Alberta. He was a prominent Mason. He leaves a widow and four children.

DR. JOHN MACKAY, a retired physician and a former member of the Ontario Legislature, died at St. Catharines on November 30th, after a long illness. He was born in Eastern Ontario seventy-seven years ago. He graduated from McGill University. After opening a practice in Woodville nearly half a century ago, he, later, took a post graduate course at Edinburgh, receiving the degree of L.R.C.P. and S.

DR. J. F. DOLAN died at his residence in Belleville on December 15th. He had been ill for only a few days when his condition suddenly became so grave that several physicians of the city were called in for consultation, and although everything possible was done to prolong life it proved unavailing. For the past twenty-five years Dr. Dolan has been following his profession and had a wide practice. His kind and sympathetic nature endeared him to all who sought his services. His death will be sincerely regretted by every citizen of Belleville where he was so well known and widely esteemed.

DR. R. RUSSELL SMALE succumbed to pneumonia on November 11th, at his home in Stayner. He studied at Trinity Medical College, Toronto, and was a scholarship graduate. After being resident physician and surgeon at St. Michael's Hospital, Toronto, he began practice at Everett; in March, 1913, he moved to Stayner. Dr. Smale was a very popular citizen, kind hearted and unassuming. He was chairman of the School Board, medical health officer and county coroner.

DR. J. A. JOHNSTON, also of Stayner, was another victim of the prevailing epidemic. From the beginning it was seen that he would have a hard fight, as he had not given in as soon as advisable. Dr. Johnston graduated at Toronto University in 1910. The greatest sympathy goes out to his wife and three little children

in their great sorrow. The whole community mourn the loss of a kind friend.

OTHER physicians who have recently succumbed to Spanish influenza are: Dr. Andrew McConville, of Kingston; Dr. D. A. Stewart, Georgetown, and Dr. Michael Donahue, Peaks, both of Prince Edward Island; Dr. T. A. Gourlay, Cayuga; Dr. Morell Oldham, Owen Sound; Dr. Osmond Pogue, Melfort, Saskatchewan.

DR. F. S. KEELE, one of the best known medical men in Manitoba, died recently at Portage la Prairie.

Miscellany

News

MANITOBA

A MEMORIAL is to be erected in Brantford to the nurses and young orderlies who have given their lives in fighting the recent epidemic of Spanish influenza in that city. One to the Brantford soldiers, fallen in the great war, will also be undertaken at a later date.

DR. BURGER has been admitted a member of the Western Roëntgen Society, to represent Manitoba. This is considered a high honour, as only skilled roëntgenologists are admitted. During his recent absence, Dr. Burger studied all the methods of the prominent roëntgenologists of Chicago, Kalamazoo, Battle Creek, Detroit, New York, and Rochester.

DR. F. OROK, late interne of the Winnipeg General Hospital, who was engaged on work in the laboratory department of the institution, died recently from pneumonia following influenza. Dr. Orok was a graduate of Manitoba Medical College.

ALBERTA

TWENTY-THREE of the leading physicians of Calgary have issued a statement to which their signatures are appended, express-

ing hearty approval of municipal hospitals provided they are kept up to or are above the standard of the present efficiency of the Calgary General Hospital. Dr. H. A. Gibson, one of the numbers represented, when called upon for an explanation, stated that the reason for taking the step was because the public press had been harping continuously on the doctors being opposed to municipal hospitals. The doctors were not opposed to municipal hospitals, but they were emphatically opposed to political capital being made out of the movement, which a small element in the city had been trying to do in regard to the Calgary General Hospital, hence their present action.

THE Medical Association of Calgary has put forth the following statement: "As medical men we are not much concerned as to who has control of the hospital; all we desire is an efficient up-to-date institution where scientific treatment of the sick can be carried out. As an association we have not approached nor pledged our support to any candidate for any public office, nor do we intend to do so. We shall use our votes and influence as citizens and rate-payers to elect men from any class who have shown themselves best fitted for the office."

THE Alberta hospital at Bowness is to be built on much the same lines as the Tranquille Hospital, and the plans have been submitted to the Hon. George P. Smith for his consideration. It is the intention of the Dominion and provincial authorities to have a conference before any final decision is made, and it is also intended to invite the heads of the tubercular institutions of the West to this conference. In this way, use can be made of their practical experience in managing hospitals under similar conditions. The original estimate for the cost of the Bowness Hospital was \$400,000 of which the province is to pay \$200,000. Mr. Smith has also a set of new plans, ten in all, for the municipal hospitals. The new series is considerably cheaper than those first submitted. The smallest plan shown is a twelve to fourteen bed hospital that can be erected for some \$4,000 less than the nine bed hospital, the unit in the other plans, which brings the cost of this hospital down to about from \$16,000 to \$17,000.

SASKATCHEWAN

GREATER efforts are to be made in the future by the provincial bureau of public health to assist the farmer in installing sanitary

schemes of heating, ventilation, water supply and sewerage disposal. Farmers who are planning new buildings are being urged by Dr. Seymour, provincial health officer, to seek the co-operation of the officials of the health bureau. An article on "House Drainage" has been issued by the bureau, and will be followed by other articles on sanitation.

A. H. HALL, deputy minister of education, has received a memorial from the teachers of the Moosomin inspectorate urging upon the government the great necessity of medical inspection for all school children. The desire of the teachers is more fully set forth in the following resolution, passed at the convention and signed on behalf of the teachers assembled there by R. L. Horning, of Moosomin, and E. H. Harris, of Red Jacket.

"That whereas the care of the pupils' health is so indispensable to his best intellectual development and that the necessary care is in some cases beyond the means of the parents to provide, and that the department of education may take whatever steps it may deem wise to secure the enactment of legislation whereby a medical clinic would be provided for each inspectorate, and further, that whereas the child's health is so vital to the best interests of the province, both from the standpoint of susceptibility to and the spread of contagious disease, and likewise to the physical and mental stamina of the manhood and womanhood of the province, that this medical treatment should be assured by providing it free of cost where necessary or desired, the cost of such to be borne by the state."

HARRIS TURNER, M.L.A., will be provincial representative for Saskatchewan for the Canadian National Institute for the Blind. C. W. Holmes, director of the Canadian National Institute, and himself a blind man, recently visited Saskatoon and spent some time with Mr. Turner discussing plans for extending work for the blind in this province. Mr. Holmes purposed, with the approval of the executive committee, to establish at least one home teaching circle in each province. A competent teacher is to be in charge, who shall not only act in the capacity expressly understood by the term, but also as a local paid representative under the immediate direction of the local member of the Western committee, which will be a centre of information and activity. Mr. Holmes said that the plan outlined was the only practicable one to advance rapidly. That such a plan, carried out, would enable him to ac-

complish more in one year, at less expense, than he could single handed, or even with a competent central staff, in five years. For several years past Mr. Holmes has been in Massachusetts in connection with educational work for the blind. When the institute was established in Toronto, he was called to Canada to take charge of it.

INOCULATION of the pupils of the public schools against influenza was commenced on November 26th, by the medical health officer, Dr. Turnbull. The first school to be operated on was the Victoria School. A considerable number of the children have been treated with the anti-influenza serum; there was no compulsion in the matter.

A PRESENTATION was made recently to Dr. McNeil, at the Provincial Hospital, Battleford, in appreciation of the almost superhuman efforts he made to relieve distress during the recent epidemic. For ten days or more Dr. McNeil hardly ate or slept but gave himself body and soul to the care of the sick. Dr. Campbell delivered the presentation address and Dr. McNeil, in acknowledgment spoke of the splendid spirit of co-operation which existed, and thanked the staff for the manner in which they individually and collectively helped through the dark days of the epidemic.

CAPTAIN C. S. Cox, of Saskatoon, has been permanently attached to the local board of Pension Commissioners as medical examiner.

DR. ANDREW CROLL has resumed practice in Saskatoon after four years absence on active service. During this period Dr. Croll was surgeon-in-chief at No. 2 Canadian General Hospital, France, and for the past eight months chief surgeon to Camp Hill Military Hospital, Halifax, and consulting surgeon to the military district of Nova Scotia.

THE question of the erection of a new hospital in Moose Jaw is to be prominently brought before the city council. The General Hospital, during the epidemic, proved entirely inadequate to meet the existing conditions. The need for a larger civic institution is felt to be very urgent. The institution opened in 1912. The admissions that year were 806; in 1918 the number had increased

to 1331 (up to October 31st). The operations in 1912 reached 148; in 1918 advanced to 440 (up to October 31st). In 1911 the citizens voted on a by-law providing \$75,000 for a hospital, but of this only \$17,000 has been used, leaving \$58,000 at present invested in Victory Bonds.

THE new Kootenay Lake General Hospital, costing \$125,000, was officially opened at Nelson.

LIEUTENANT J. M. WESSEL, quartermaster of No. 12 Casualty Unit at Regina, has announced that the Invalided Soldiers' Commission purpose to establish a 200 bed hospital in Saskatoon. It has been known for some time that the Saskatchewan branch of the Hospital Commission has been cramped for room, but it was at first thought that Moose Jaw would be chosen for the new military hospital.

ARMY MEDICAL SERVICES

In the New Year Honour List appear the names of the following officers attached to the Canadian Army Medical Corps:

The Order of Companions of St. Michael and St. George: Colonel Hugh Chisholm, C.A.M.C.; Colonel Spurgeon Campbell, C.A.M.C.; Colonel John Kidd, C.A.M.C.; Colonel William Simpson, C.A.M.C.; Colonel Robert P. Wright, C.A.M.C.

Commanders of the Order of the British Empire: Colonel George Farmer, Colonel John Stewart, Matron Bertha Willoughby, all of the C.A.M.C.

Officers of the Order of the British Empire: Colonel Richard Raikes, Major James Goodall, Major Percy McGillivray, Colonel Albert Smith and Colonel Albert Wimmett (dentals), all of the C.A.M.C.

The Military Cross has been awarded to Captain Charles Atkinson, C.A.M.C.; Captain George Baby, C.A.M.C.; Captain Dougal Banquier, C.A.M.C.; Lieutenant Daniel Cameron, C.A.M.C.; Captain Alexander Campbell, C.A.M.C.; Major Frederick Clarke, C.A.M.C.; Captain Harry Dunlop, C.A.M.C.; Captain Bellenden Hutcheson, C.A.M.C.; Captain Gerald Grant, C.A.M.C.; James Barry, C.A.M.C.; Joseph Eagar, C.A.M.C.

THE Distinguished Service Order has been awarded to Major Stanley G. Ross, of the Canadian Army Medical Corps, for taking

charge of collecting posts and advanced stations on three successive days.

THE Distinguished Service Order has been awarded to Colonel Robert Mills Simpson, of the Canadian Army Medical Corps; when a sudden attack resulted in the capture of a village he personally dressed the wounds of men on the field and evacuated them all by the evening.

Colonel R. Percy Wright, mentioned in the New Year's honour list, and granted a C.M.G., achieved two promotions in the field, three mentions in despatches, a D.S.O., a staff appointment, and is now A.D.M.S. First Canadian Division. He was a medical student of McGill University.

THE Bar to the Military Medal has been awarded to E. H. Code, Canadian Army Service Corps.

Dr. Mowat, McCormick, a Toronto physician, who went overseas in the C.A.M.C., and who has lately been a prisoner in Germany, has been released. He has just reached his home in Ottawa.

AN order has just been issued by the Adjutant-General's branch at Military Headquarters, Ottawa, to the effect that no medical officers, not on full duty on the establishment of the Canadian Army Service Corps in the district will be permitted after December 31st, 1918, to wear uniform while in discharge of his ordinary military duties, or while pursuing his civic avocation. This order refers principally to medical and dental officers who do not devote their entire time to military duty.

CAPTAIN E. JOINVILLE, of London, Ontario, has been attached to the Military Hospital Staff as eye, ear, and nose specialist. Dr. T. A. Carson, who recently returned from France, after strenuous service behind the lines, and has been on the medical staff at Brantford for the Militia, has been appointed to the Pensions Board of the Invalid Soldiers' Commission, with headquarters in Toronto.

DR. G. STERLING RYERSON, founder and past president of the Canadian Red Cross Society, has resumed practice in Toronto after four years' work in France and England, and various parts of the American Continent, in the interests of the Canadian and American Red Cross Societies.

THE contributions received for France's Day Fund for Canada up to October 31st, 1918, for the French Red Cross, and remitted to the treasurer of the London, England, committee, are as follows: Alberta, \$25,000.00; British Columbia, \$2,702.76; New Brunswick, \$5,156.25; Nova Scotia, \$25,500.00; Ontario, \$26,547.27; Quebec, \$25,793.70; Saskatchewan, \$25,200.30; making a total of \$135,900.28. Manitoba is not included, as it paid its contribution direct to the French Red Cross.

THE following cable was sent to M. Poincare, President of France, by the Chairman of the Central Council, at the direction of the Executive Committee:

"I have the honour to inform you that the Canadian Red Cross Society desire you to accept a gift of fifty thousand pounds, which sum they wish you to have expended for the benefit of the refugee men, women and children of France. The funds are being cabled to our Commissioner in London, with instructions to forward to you."

Appointments:—Captain Robert Edmund Johnston, appointed Adjutant of the Spadina Military Hospital. Captain William Boyd McKechnie, posted for duty at the Vancouver Military Hospital. Captain Harold Dickson Courtenay is seconded for service with the Royal Canadian Naval Air Service. Lieutenant Ross Burt Taylor is posted for duty under the A.D.M.S., M.D. No. 5.

The following officers have been appointed to the Clearing Services Command:—

At Headquarters:—Lieutenant-Colonel Robert Harold Ker, to be A.D.M.S. Embarkation. Major Harold Brown Jeffs, M.C., to be D.A.D.M.S. Embarkation.

At Halifax:—Captain Edward Sheffield, to be Port Medical Officer. Captains L. N. Vandadaigue, S. H. Ratner, A. C. Robertson, F. J. Couglinh. Lieutenants C. L. Derrick, J. D. Chaput, R. J. Paquin, A. E. Dube, J. H. Lapointe, C. A. Bourdon, W. Morrish, E. D. Brown.

Halifax Depot:—Captain Charles C. Archibald, to be acting Embarkation Medical Officer. Major Stewart Sherwood Skinner is posted for duty at St. John Military Hospital. Captain Robert Henry Sheard is posted for duty under the A.D.M.S. M.D. No. 2, on ceasing to be employed with the B.C.R.M.

Promotions.—To be Captains:—Lieutenant Alexandre Zéphirin

Crépault, Lieutenant Sprague Murray Palmer, Lieutenant David Claw Wilson, Lieutenant Pierre Dupuis. Major Clarence Hamilton Morris to be Lieutenant-Colonel whilst employed as D.A.D.M.S., M.D. No. 6 (temp.). Captain William E. Struthers to be Major in the Reserve of Officers, C.E.F.

CASUALTIES

Died on Active Service

NURSING SISTER L. M. JENNER, St. John, New Brunswick.

NURSING SISTER V. B. HENNEN, Saskatchewan.

NURSING SISTER E. V. MCKAY, Galt, Ontario.

Died of Wounds

CAPTAIN NEVILLE H. LITTLE, C.A.M.C., Trenton, Ontario
F. T. WATTS, C.A.M.C., London, Ontario.

Died

NURSING SISTER AINSLIE ST. CLAIR, Winnipeg.

F. GALLEY, C.A.M.C., Montreal.

R. LLOYD ORR, C.A.M.C., London, Ontario.

J. SMITH, C.A.M.C., Scotland.

R. SHELDON, C.A.M.C., England.

Book Reviews

THE UNGEARED MIND. By ROBERT HOWLAND CHASE, A.M., M.D., physician in chief, Friends Hospital (for Mental Diseases). 338 pages, illustrated. Price, \$2.75. Publishers: F. A. Davis Company, Philadelphia, 1918.

"The Ungeared Mind" is not a book likely to have a large circulation either with lay or professional elements. It has little or no claim to scientific distinction and from the literary standpoint is not attractive. Just why it was published is a mystery, as it is without the sense of humour which might redeem, to a certain

extent, a hodge podge of so called psychiatric gossip. Possibly the foregoing statement is almost too severe as there are touches which are not devoid of humour, such as the following, "Warm and moist hands, after they have been long cold and dry, is a favourable sign."

A MANUAL OF OTOTOLOGY. By GORHAM BACON, A.B., M.D., F.A.C.S., formerly professor of otology, College of Physicians and Surgeons, Columbia University, New York, assisted by TRUMAN LAURANCE SAUNDERS, A.B., M.D., assistant professor of laryngology and otology, College of Physicians and Surgeons, Columbia University. Seventh edition, revised and enlarged with 204 illustrations. Publishers: Lea & Febiger, New York and Philadelphia, 1918.

The issue of a seventh and revised edition of this well-known manual is evidence of the intrinsic merit of the work as a textbook. The present volume has been carefully re-edited, and the labyrinth receives the importance which it deserves, a result largely of the weight attached to its condition of health in the examination of candidates for the air service.

SURGERY OF THE SPINE AND SPINAL CORD. By CHARLES H. FRAZIER, M.D., Sc.D., professor of clinical surgery and surgeon to Hospital of University of Pennsylvania, with the collaboration of ALFRED REGINALD ALLEN, M.D., associate in neurology and neuropathology, University of Pennsylvania, Philadelphia. 922 pages with illustrations. Publishers: D. Appleton Company, New York and London, 1918.

This book by Dr. Charles H. Frazier, of the University of Pennsylvania, with the collaboration of Dr. A. R. Allen, of the neurological staff of the same university, represents the best and most complete monograph on the subject that exists in the English language, and, so far as the reviewer knows, in any language. It is in effect a classical monograph, and bids fair to be of permanent value for many years to come. In addition to the clinical chapters written by Dr. Frazier, are given four special chapters; one upon the "Anatomy of the spine and spinal cord", by Professor Piersol; one upon the "Normal and pathological physiology of the spinal cord", by Professor Allen; the third on the "Cerebrospinal fluid and its relation to spinal diseases", by Professor Kolmer; and the fourth on the "X-ray examination of the spine", by Professor

Pancoast. In order to give an idea of the rest of the contents of the book we append a list of the chapter headings. V. Spina Bifida; VI. Trauma; VII. Stab and Gunshot Wounds; VIII. Spinal Tumours; IX. Meningitis; X. Surgery of the Spinal Cord; XI. Technique of Rhizotomy; XII. Lumbar Puncture; XIII. Intraspinal Therapy; XIV. Spinal Anaesthesia; XV. Laminectomy; XVI. Chordotomy; XVII. Decompressive Laminectomy. There are some eight coloured plates and charts, and 378 illustrations, most of them original.

It is difficult to speak too highly of the general excellence of Dr. Frazier's book. Each of the subjects mentioned is treated thoroughly, and excellent bibliographies are added to each chapter. The subject of each chapter is considered exhaustively, and the writer's large experience and close study is combined with a consideration of the work of others to form a very satisfying whole. It is impossible to single out any particular chapter for special commendation, but it may perhaps be said that the one on the surgery of the roots for the relief of spasticity and of pain is exceptionally good. It is gratifying to be able to add that the work is written in excellent English.

MODERN OPERATIVE BONE SURGERY, with Special Reference to the Treatment of Fractures. By CHARLES GEORGE GEIGER, M.D., 273 pages with 120 illustrations. Price, \$3.00 net. Publishers: F. A. Davies Company, Philadelphia, 1918.

The name of Charles Geiger has hitherto been chiefly known to the profession as the deviser of a set of instruments electrically driven for use in bone surgery. In this he shares with several others the credit—and it is no small credit,—of furnishing to the general surgeon an apparatus without which the best work in modern bone surgery can hardly be done. It would perhaps hardly be fair to say that the book here under review was merely written around Dr. Geiger's set of bone instruments. It is true that a large part of the book, which is 275 pages of text with 116 illustrations, is devoted to the description of Dr. Geiger's technique in cutting bone inlays and intramedullary dowels and their transplantation; and that moreover the bulk of the work concerns the operative treatment of fractures by these methods. And it can be said that this part of the work is well done. The large number of illustrations are also clear and valuable, although it may be remarked in passing that it is rather curious to find so many of them taken from the late Dr. Murphy's skiagrams illustrating the value of common

nails in the fixation of fractures. This is rather in contradiction with the author's vehement defence of the autogenous bone graft.

There are several chapters reviewing the subject of the bone forming functions of the periosteum and the general repair of bone, consisting very largely of quotations from the work of men who have in recent years advanced our knowledge of this subject, ranging from Ollier through Macewen, Axhausen, and others, down to Phemister. It cannot be said that the author leaves the subject quite clear, as he seems to accept the conclusions formed by both sides of the "periosteal" controversy. Critical judgement is lacking, nor can the author's résumé of the work done in this field be considered as more than a mere résumé. The bibliography is entirely lacking, so that the book cannot be described as being a scientific presentation of our knowledge of bone surgery at the present day. Taken, however, as a piece of practical work and as a guide to the surgeon who desires to do first class operative work on bones, the book can be heartily recommended.

EQUILIBRIUM AND VERTIGO. By ISAAC H. JONES, M.A., M.D., laryngologist, Philadelphia General Hospital. With an Analysis of Pathological Cases by LEWIS FISHER, M.D., laryngologist and otologist, Mt. Sinai Hospital, Philadelphia. Adopted as standard for medical division, Signal Corps, Aviation Section, by Surgeon-General, and Chief Signal Officer, U.S. Army. 432 pages with 130 illustrations. Price, \$5.00. Publishers: J. P. Lippincott Company, Philadelphia, London, 201 Unity Bldg., Montreal, 1918.

The appearance of this volume from the pen of the man who has done more than any other to develop an interest in the bearing of pathological conditions of the labyrinth upon the capacity of those who fly in the air to maintain their equilibrium, will arouse widespread interest, and become of great value to those who will control the selection of the men who are to apply the art of flying to the needs of peace conditions. Many of the questions involved cannot be looked upon as settled, but this volume points the way to a world-wide investigation of supreme importance.

